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ABSTRACT

The Sharing Success program, recognizes exemplary public school programs and practices in the states of Alabama, Florida, Georgia, Mississippi, North Carolina, and South Carolina. Each year, SERVE emphasizes a specific program area for recognition based on one of the national goals for education. This "Sharing Success" publication documents several dozen of the region's most effective programs in the areas of mathematics, science, and technology (computer-assisted instruction). Programs are ranked for quality and innovation and are presented in three sections: (1) Programs of Excellence, highest rated programs (21) in the areas of Mathematics, Science, Math/Science, and Technology (e.g., science--tropical rain forest, summer science fun lab; math--elementary math lead teachers, problem-solving approach to algebra; math/science--Hayes Cooper Center [magnet school]; technology--writing to write); (2) Quality Programs (46) meeting a high standard (e.g., computers in elementary education, outdoor education, open-air classroom); and (3) Promising Programs and Practice (13) that have yet to be fully established. A one-page description of the program is provided for each in the "Excellent" category; briefer half-page summaries are provided for the "Quality" category; and one paragraph summaries for the "Promises" in print. All summaries contain information concerning the contact person and the guideline(s) of the program. The final section includes a very brief description of the National Diffusion Network (NDN), the names of locations of the region; NDN state facilitators and a brief sampling (21) of related NDN programs elsewhere in the United States. (MDH)

ED359026

SHARING SUCCESS IN THE SOUTHEAST:

MATH, SCIENCE, AND COMPUTER EDUCATION

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SouthEastern Regional Vision for Education

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SHARING SUCCESS IN THE SOUTHEAST:

MATH, SCIENCE, AND COMPUTER EDUCATION

SERVE
SouthEastern Regional Vision for Education

Affiliated with the
School of Education
University of North Carolina at Greensboro
and the
Florida Department of Education

May 1992

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ABOUT THE SHARING SUCCESS PROGRAM

The Sharing Success program, sponsored by the SouthEastern Regional Vision for Education (SERVE), recognizes exemplary public school programs and practices in the states of Alabama, Florida, Georgia, Mississippi, North Carolina, and South Carolina. Each year, SERVE emphasizes a specific program area for recognition based on one of the national goals for education. This *Sharing Success* publication documents several dozen of the region's most effective programs in the areas of mathematics, science, and technology (computer-assisted instruction).

In addition to recognizing exemplary programs, a primary goal of Sharing Success is to do what the program's name implies: share information about successful programs with educators throughout the region. Teachers and principals face similar challenges all over the Southeast and do not have to reinvent the wheel when they can learn from others. The program descriptions are intended to provide information and inspiration to others to try new teaching strategies. You are encouraged to call the contact persons for further information about the programs.

The selection process for Sharing Success programs begins with invitations to state education agencies and school districts to nominate successful programs and practices. The simple self-nomination form asks for a brief description of the program, details on its operation and costs, and evidence of its effectiveness. A panel of reviewers, consisting of subject areas specialists from state departments of education and district staff throughout the region, evaluates the programs.

Reviewers divide winning nominations into three categories. The most highly-rated are judged **Programs of Excellence** and are verified through a site visit by a two-member team of reviewers. In the next category are **Quality Programs**, which must also meet a high standard as judged by reviewers. Finally, **Promising Programs** are programs which are often new and show excellent potential, but which may not be fully established or documented.

To receive a copy of the Sharing Success application or to request additional information about SERVE or the Sharing Success program, contact:

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SHARING SUCCESS IN THE SOUTHEAST: MATHEMATICS, SCIENCE AND TECHNOLOGY was produced with the help of a Regional Review Panel, the SERVE Field Representatives, teams of on-site reviewers, and many others from the region. Without their dedicated assistance, the Sharing Success Program could not be implemented and this publication could not have been produced.

SERVE thanks those educators who submitted nominations of programs for consideration in Sharing Success as well as the teachers, principals, and district staff who are listed as contacts in this document. Their commitment to educational excellence in the Southeast is evident by what their schools and students have achieved and by their willingness to provide information and assistance to other schools interested in replicating their programs and practices.

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PROGRAMS OF EXCELLENCE

ACTIVITY-BASED TEACHING METHODS

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Designed with the belief that teacher and student attitudes toward science education can be positively affected by positive teaching and learning experiences, the Activity-Based Teaching Methods program provides teachers with models of effective planning and teaching strategies.

The primary objectives of the Activity-Based Teaching Methods program are to (1) increase the amount of science instruction and the variety of teaching methods used to improve students' science process skills and (2) increase student use of the science process skills identified in the Mississippi State Curriculum Structure. The ultimate goal of the project is to increase confidence and instill positive attitudes about science in both teachers and students so that they will eagerly anticipate each science lesson with curiosity and high expectations.

The Activity-Based Teaching Methods program serves all students in the Drew School District either directly or indirectly. Students in grades K-3 and 9-12 participate directly in the program, with the latter group serving as mentors/tutors for the younger students by conducting simple science experiments under close supervision of high school teachers. The program also addresses the special needs of at-risk students. Through funds provided by the Energy Corporation, experienced high school teachers work directly with elementary teachers and students.

Students are additionally served through the science training their teachers receive. To address teacher confidence and attitude, high school teachers model science teaching methods using inquiry, discovery, demonstration, and hands-on teaching activities for district elementary and middle school teachers. Each teacher is also provided activities and materials for science experiments.

The program's innovation lies in its focus on skills and attitudes. By concentrating on these fundamentals, the Activity-Based Teaching Methods approach provides students at every grade-level with the confidence and desire to succeed in science.

PROGRAM OF EXCELLENCE

Grades K-3; 9-12

Principal
Henry Phillips

Superintendent
W. Harris Terry
Drew Separate
School District

THE TROPICAL RAIN FOREST

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PROGRAM OF EXCELLENCE

Grade 1

Principal
David McNally

Superintendent
Howard Morris
Morgan County

Margaret Mead once counseled: "Never doubt that a small group of thoughtful, committed citizens can change the world. Indeed, it's the only thing that ever has." Two teachers at Lacey's Spring Elementary School believe that teaching first graders about the tropical rain forests of South America is an important first step in saving the forests from destruction. Through the Tropical Rain Forest project, first-grade teachers Susan Grunwald and Yvonne Hornbuckle have developed a year-long project on the rain forest, examining the impact of rain forest destruction on its inhabitants as well as its global impact.

Among the objectives of the project are to teach students to appreciate the beauty of the rain forest and the creatures that inhabit it, to recognize the alarming rate at which the rain forest is being destroyed, and to acknowledge the importance of environmental responsibility. The project also seeks to develop skills in mathematics, science, social studies, geography, language arts, and reading through an integrated curriculum.

With the help of fellow teachers, parents, and other students, the teachers have transformed an unused classroom into a replica of a rain forest, complete with plant species, animals found in a rain forest, and tape-recorded forest sounds. Lush tropical plants and paper leaves and vines cover the floors, walls, and ceiling, and the replica is inhabited by toy, paper mache, and rubber snakes, iguanas, and other animals. When the sixth graders hosted an open house for their rain forest, over 500 visitors, excluding Lacey's Spring students, attended. The project also attracted the interest of McDonald's Restaurant, which donated various resource materials to the project.

To further their studies, students have gone on field trips to a breeder farm, the Animal Zoo, to see a number of species that are found in the rain forest. Visitors to the classroom have included a teacher from another school in the county, who presented a skit about a snake from the book *Crictor*, and a local snake breeder, who bought a variety of snakes, including a boa constrictor, that the children could touch. Students have also learned a rap song about the forest, and a friend of one the class members wrote a poem about the forest for the first graders. The class also staged a play for the PTA based on the book *The Great Kapok Tree*.

The first graders became directly involved with the efforts to save the rain forest by adopting four acres of rain forest in Guatemala with funds raised at a bake sale they hosted for the school.

MICROCHEMISTRY

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A significant challenge in teaching chemistry has been the restructuring of laboratory activities to ensure safety, both in the selection of chemicals and the procedures with which they are used. Equally challenging have been the development of scientific inquiry skills through laboratory investigations, meeting laboratory requirements in high-cost courses, covering the entire curriculum framework, and replacing laboratory materials prescribed by adopted textbooks with chemicals and equipment meeting current safety standards. Microchemistry has provided the means to meet all of these challenges at Sandalwood Senior High School.

Sandalwood has adopted the small-scale chemistry techniques of Dr. Hubert Alyea of Princeton University, who designed desk-top equipment for use in college chemistry courses conducted in auditoriums. Sandalwood teachers have adapted Alyea's techniques for high school microchemistry courses by reducing equipment to a still smaller scale, using teacher-made equipment, lowering costs, and involving more frequent interaction by students. The teachers have also used innovative equipment to redesign traditional labs at the microchemistry scale, using many of the excellent materials developed by high school teachers at the Woodrow Wilson Chemistry Institutes.

The basic equipment in the lab consists of spot plates, plastic microliter plates and strips, plastic transfer pipettes, mini-ice cube trays, plastic audio-tape boxes, and small conductivity testers. The pipettes, which are inexpensive and reusable, are modified for use as dropping bottles, funnels, and gas collection devices. Student lab sets consist of several small enclosed droppers (one inch high) in a plastic cassette box or mini ice-cube tray. Many lab activities can be implemented in fully-equipped chemistry labs or at a student's desk. Since microchemistry is faster as well as smaller, repeated experimentation is possible within the confines of a 50-minute class period.

All students wear goggles and appropriate lab attire. Open beakers of chemicals are no longer used, and reactions are done on small spot plates with 12, 24, or 96 wells in lieu of test tubes. Student safety is also improved through the use of extremely small quantities of materials. Quantities are cut by one-tenth and involve 100 microliter of solution or less, and very little glass is handled.

The microchemistry activities flow with, not after, the curriculum with lab activities involving inquiry, rather than merely the illustration and practice of a concept learned in class. A lesson can begin with students testing examples and asking why events occur—using the critical thinking and problem solving skills essential to real learning. Scientific literacy and safety are enhanced by the use of consumer products rather than laboratory chemicals to increase student awareness of household chemicals.

To share the techniques of the Sandalwood microchemistry program with other teachers, the First Coast Alliance of Chemistry Teachers and the Jacksonville chapter of the American Chemical Society have sponsored an extensive outreach program in five northeast Florida districts. This program offers teachers workshops and inservice sessions in microchemistry as well as opportunities to participate in practice labs.

PROGRAM OF EXCELLENCE

Grades 9-12

Principal
J. Emory Trawick

Superintendent
Dr. Larry Zenke
Duval County Schools

RESEARCH TRIANGLE SCIENTIST-TEACHER PARTNERSHIP

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PROGRAM OF EXCELLENCE

Grades K-8

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Gerry House
Chapel Hill
Carrboro County

Dramatic improvements in science and mathematics education are possible when scientists, engineers, parents, and science/mathematics educators work with teachers to improve instruction. To accomplish this goal, the Research Triangle Scientist-Teacher Partnership provides the training, support, and resources necessary to transform science and mathematics instruction into participatory, "hands-on" explorations of nature and technology. This program serves six districts, including Wake, Durham, Orange, Chatman, Durham City, and Chapel Hill/Carroboro.

Through the Partnership program, teachers are placed in internships with technology industries where they can acquire more accurate impressions of scientists and engineers and investigate practical applications of science and technology that can be developed into participatory classroom exercises. The program also brings industry and college professionals to K-12 science and mathematics classrooms to observe the problems associated with science and mathematics education, to assist in the development of "hands-on" instructional techniques, and to heighten students' awareness of the work that scientists and engineers do.

As part of the program, teachers have developed an activity manual, structured the program to meet their grade-specific needs, and designed an easy-to-use protocol for requesting volunteers. Parent volunteers assist in the scientist-teacher matching process under the direction of Partnership staff.

With the help of area industries and universities, the Partnership is also developing workshops to help volunteers communicate more effectively with the various grade levels they serve and foster better communication between scientists and teachers.

Conceived by Dr. Dennis DuBay, a research botanist at North Carolina State University (NCSU), the Partnership program was initiated in 1989 as a cooperative effort among NCSU, the Wake County School System, the Wake County Education Foundation, and area industries. The first year, the Scientist-Teacher Partnership received and answered over 650 requests from 250 teachers in 42 elementary schools and seven middle schools.

The requests, which served approximately 5,300 students, were answered by 300 volunteers from over 50 industries, universities, government agencies, professional societies, and clubs. During the 1990-1991 school year, the Partnership arranged 1,500 elementary classroom visits to more than 375 teachers and approximately 10,000 students. In the 1991-92 school year, the program expanded to include all elementary and middle schools in the six districts that cover the Research Triangle region.

SCIENCE IS ELEMENTARY

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The Science is Elementary program stimulates student curiosity and creativity through exciting activities, including weekly laboratory experiments, that help integrate science performance standards into the existing curriculum. The goal of the program is to use science as a vehicle to teach or reinforce instruction in all other subject areas.

Basic skills in science are taught through the use of activities that start with questions about phenomena rather than with answers to be memorized. Students are actively engaged in learning through critical thinking, the collection and use of evidence, and the design of investigations and processes.

Through a joint effort between the Science Department of the School Board of Broward County and its Partner of Excellence--Florida Power and Light Company - Science is Elementary serves elementary and middle school students of every ability level. Its four basic objectives include (1) helping students develop a positive attitude toward science, manipulate quantitative matters, think critically, measure accurately, and use tools and instruments correctly; (2) providing a method for teaching and testing the mastery of state-identified science skills through hands-on, inquiry-based activities supplementing paper and pencil and multiple-choice exams; (3) presenting process skills as a vehicle to enhance students' cognitive and affective development in science and other subject areas; and (4) developing an enjoyable and inexpensive hands-on science laboratory activity program for K-8 teachers.

An essential ingredient of the program is teacher training. One or two teachers from each grade level at each school are trained during Saturday workshops. These teachers then return to their schools with sufficient materials to train the remaining teachers in their grade level and to coordinate efforts to assemble and organize materials for laboratory activities. Since the program's inception, over 1,500 teachers have received inservice instruction and have, in turn, conducted school-based training for their colleagues. The result has been the implementation of laboratory activities impacting thousands of students.

Support for Science is Elementary is provided through a communication network that has been established among participants and a cadre of forty county-identified personnel who are available to assist participants with program implementation. In addition, parents and community volunteers contribute materials, develop kits, and facilitate the use of the kits in the classroom.

The program's greatest accomplishment has been to foster excitement about science. Follow-up surveys reveal that a great number of teachers are now using science activities as a supplement to district tests to verify mastery of minimum skills, and letters from teachers confirm that they are enthusiastically incorporating the science activities into the curriculum.

PROGRAM OF EXCELLENCE

Grades K-8

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SUMMER SCIENCE FUN LAB

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PROGRAM OF EXCELLENCE

Grades 2-6

Principal
Joe Duncan

Superintendent
Mike Wamsley
Alcorn County Schools

The two major goals of Kossuth Elementary School's Science Summer Fun Lab are to inspire children in grades 2-6 to develop positive attitudes towards science learning and to help them recognize the important role that science and technology play in all aspects of life.

The Summer Science Fun Lab seeks to achieve these goals by helping students (1) learn science concepts through manipulation of materials; (2) develop problem-solving skills to answer questions derived from their curiosity; (3) develop effective observation and communication skills as they relate their discoveries; (4) develop critical thinking skills as they analyze the results of their experiments; (5) gain knowledge about science concepts through fact-finding research; (6) learn to operate technological and scientific equipment through hands-on experiences with computers, microscopes, screen-printing, etc.; (7) develop positive attitudes towards learning science; (8) involve their families in experimentation and exhibition of projects; (9) improve in science process and inquiry skills; (10) engage in cooperative learning experiences through cross-grade grouping for project assignments; and (11) develop positive self-concepts through participation in science activities and interactions with families and peers.

To accomplish these objectives, the Summer Science Fun Lab project provides children opportunities to explore science concepts through hands-on experiences in a relaxed, camp-like environment featuring field trips, special assignments, presentations by experts, and computer activities. To create a non-threatening atmosphere, instructors establish cross-grade groupings, and neither textbooks nor report cards are used. The Summer Science Fun Lab avoids presenting science as a collection of facts, giving students the mistaken impression that everything about science is already known and can be found in a textbook. Rather, by presenting science as a process of inquiry, the Summer Lab encourages students to make original discoveries, thereby increasing both their knowledge of and interest in the field of science.

The Summer Science Fun Lab is a broadly collaborative effort. A project director coordinates staff development/inservice training activities, schedules activities and special presentations, and designs instruments to measure students' abilities and attitudes. Instruction, which focuses on earth, physical and life sciences, is provided by certified staff assisted by parent and community volunteers. Area businesses provide educational materials, refreshments, public service announcements, and demonstrations of technical applications.

The Summer Science Fun Lab project further involves participants' parents by sending home a folder with directions for ten family experiments to be conducted at home. These experiments enable students and parents to observe natural phenomena and experiment with science concepts in a manner designed to foster their natural curiosity. Parents are also invited to attend camp activities and observe or assist with lab experiments and field trips.

STARS: SUPERIOR TEACHERS AS RESOURCES IN SCIENCE

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Through Superior Teachers As Resources in Science (STARS), veteran classroom science teachers serve as instructional leaders and trainers in district-wide education workshops. Initiated in Volusia County, the program challenges science teachers who have received recognition for exemplary programs to share their expertise with other teachers.

The STARS program identifies expert teachers through recommendations, site visits, and interviews with the district science specialist. Teachers who are interested in presenting a district workshop for other teachers are matched with the appropriate grade level and a university professor. Using a team teaching approach, they develop science workshops for other teachers.

Through the teachers-teaching-teachers format, STARS teachers become role models for both curriculum development and delivery. STARS are able to "mirror" quality instruction and provide direction, scope, and motivation to other teachers in the district.

Special recognition is given to STARS participants. Each "STAR" receives a gold nameplate, embedded with a star, which is hung on his or her classroom door. STARS' achievements are also celebrated at an awards banquet attended by business and university representatives, parents, teachers, administrators, school board members, and Science Advisory members.

Since the STARS program's introduction, 27 expert science teachers from local elementary, middle, and high schools have conducted district-wide workshops and, thus, impacted approximately 2,000 students. Evaluations by participants and administrators indicate that the STARS program has successfully increased teachers' confidence and enthusiasm for teaching science.

PROGRAM OF EXCELLENCE

Grades K-12

Superintendent
Dr. Joan Kowal
Volusia County Schools

THE CLASS COMPANY: CLASSCO

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PROGRAM OF EXCELLENCE

Grade 6

Principal
David McNally

Superintendent
Howard Morris
Morgan County Schools

Conceived, established, and operated by sixth-grade students at Lacey's Spring Elementary School, CLASSCO is a fully functioning button-making company. Through this innovative enterprise, students learn first-hand the basic principles of forming and operating a small business as well as critical thinking, decision making, and consumer and team skills.

CLASSCO was first envisioned when a selection in the sixth- grade reading textbook prompted the students to contemplate the possibility of starting their own company. After discussing the pros, cons, and logistics of forming a business, the students invited several owners of small businesses to speak to them about starting a small business. Then, the class interviewed and selected student officers for the company. They accompanied their teacher to the bank, where they met with the bank president, applied for and obtained a loan of $200 to purchase button-making equipment and start-up supplies, opened a checking account, and launched the enterprise officially.

The 24 sixth graders who own and operate CLASSCO range in age from 11 to 14 years and in ability levels from learning disabled to talented and gifted. They work for the company for approximately 30 minutes each day in four shifts that are scheduled to avoid conflicts with the regular class schedule or extracurricular activities. Each shift's supervisor, who is accountable for worker output, monitors the quality as well as the quantity of production. The company officers are responsible for verifying the accuracy of the paperwork and making sure the system is running smoothly. They are advised by the CLASSCO board of directors, comprised of the school principal and members of the community. Parents serve as the sales force.

In addition to introducing students to banking procedures, CLASSCO also teaches basic consumer mathematics, such as computing wages and calculating correct change, and corporate business practices, such as establishing a board of directors and selling stock. The button-making process also provides students with hands-on experience on a factory assembly line. In addition, CLASSCO helps students develop decision-making skills, budget time efficiently, and develop a work ethic by teaching them to appreciate the effort involved in producing a quality product and the importance of working cooperatively with others.

By tapping the students' unique skills and talents and highlighting their achievements, CLASSCO has been particularly successful in fostering positive self-concepts. Each student realizes the value of his or her contribution to the project and shares in the pride of its success.

MARIETTA HANDS-ON MATH

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Marietta Hands-On Math promotes the use of concrete manipulatives in the teaching of mathematical concepts to primary school children. Through the program, children are introduced to mathematical concepts with hands-on activities involving the manipulation of concrete objects. Once they have mastered computations with manipulatives, they are given pencil and paper exercises with abstract symbols. The primary purpose of the program is to provide age-appropriate mathematics instruction to primary school children.

Participating teachers receive a classroom set of math manipulative materials and attend a one-day training workshop where they learn to incorporate the manipulatives into the curriculum. This program serves all K-2 students in the Marietta City School system, and the materials are designed to meet district and state curriculum requirements.

Marietta Hand-On Math demonstrates that the systematic use of concrete manipulative materials during mathematics instruction improves concept development, problem solving, and computation as measured by achievement tests. It also confirms that when teachers are adequately trained and provided with appropriate materials, they can make a positive difference in mathematics instruction and their students engage in significantly more hands-on learning activities than students in traditional classrooms.

To make parents aware of the teaching strategies and the importance of using manipulatives to teach math concepts, letters are sent to parents explaining the program and inviting them to attend workshops at which the program is demonstrated. The letter also includes a brochure from the National Council of Teachers of Mathematics endorsing the program's innovations and effectiveness. Presentations are also made at parent meetings in the Marietta schools.

Since its implementation, Marietta Hands-On Math has resulted in dramatic improvements in test scores, particularly for at-risk children. As a result of excellent evaluations, it was validated as an Innovation Program by the Georgia State Department of Education in 1988. Since that time, the program has been adopted by 115 schools across the state.

PROGRAM OF EXCELLENCE

Grades K-2

Superintendent
Dr. Roy Nichols, Jr.
Marietta City
School District

ELEMENTARY MATH LEAD TEACHER

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PROGRAM OF EXCELLENCE

Grades K-5

Superintendent
James Brown
Oconee County Schools

A collaborative effort between the University of Chicago and the Oconee County school district, the Elementary Math Lead Teacher program is a staff development model designed to improve mathematics instruction. In this program, generalist teachers at the elementary level are trained to serve as Lead Math Teachers—specialists providing mathematics leadership at their schools.

Participants are administered a pre-inventory to assess their knowledge of mathematics content and awareness of current trends and exemplary practices in math education. They then complete training in school leadership, mathematics content, and techniques for coaching teachers in self-contained classrooms on effective mathematics instruction. Participants are required to complete 300 hours of course work, for which they receive credit towards certification as math specialists. The courses, which follow the National Council of Teachers of Mathematics' curriculum, assessment, and teaching standards, are monitored by University of Chicago specialists. Instruction includes MathTools (University of Chicago School Mathematics Project), AIMS (Activities Integrating Math and Science), MCTP (Australian Teacher Training), NCTM (membership and training), computer use, and cooperative learning.

Lead teachers' responsibilities include conducting extensive in-service training at their schools and other schools throughout the district and state and updating mathematics education at their schools. They meet weekly to coordinate their efforts, compare notes, and plan for future efforts.

To achieve the program's goal of improved mathematics education for all elementary school students, including special needs students, the program seeks to designate twenty volunteer elementary teachers as Lead Math Teachers at each elementary school in the district.

A PROBLEM-SOLVING APPROACH TO ALGEBRA

Contact:

Cynthia Wilkins
Mathematics Teacher
Northwest Rankin Attendance Center
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Brandon, MS 39042
(601)992-1329

Rankin County teachers use the Problem-Solving Approach to Algebra to encourage students to take an active role in their learning. In this program, students concentrate on mathematics concepts, engage in cooperative problem solving, and explore mathematics applications. The role of the teacher changes from the "source of all knowledge" to that of a facilitator who guides the students to new discoveries.

The Problem-Solving Approach to Algebra program serves approximately 150 seventh- and eighth-grade pre-algebra and algebra students, all of whom have scored in the highest quartile on the Stanford Achievement Test.

The six objectives that drive the program specify that students will be able to (1) understand underlying mathematics concepts; (2) develop flexibility in selecting appropriate problem-solving strategies; (3) communicate orally and in writing the thought processes used to solve mathematical problems; (4) assume responsibility for learning mathematics concepts and confer in seeking solutions to problems; (5) develop confidence in their own ability to solve problems; and (6) transfer mathematics applications to other course concepts, mathematics courses, and subject areas.

To accomplish these objectives, teachers select mathematical tasks which appeal to their students' interests and intellect, stress both the understanding and application of mathematical concepts, encourage discussion of mathematical concepts and ideas, use and help students use technology and other tools appropriately, seek connections between prior and developing knowledge, and guide individual, small-group, and whole-class work. Individual desks have been replaced with tables at which students work in groups and are encouraged to freely discuss their solutions, strategies, and problems.

Whenever possible, teachers introduce new concepts through manipulatives, games, and group activities. Enrichment activities related to concepts being studied are interwoven into the curriculum, and examples from other subject areas, especially science and future math courses, are used to illustrate mathematics concepts. Students are challenged with a "problem of the week" and write about mathematics in daily journal entries and a class log. Teachers give weekly progress reports to students and contact parents frequently concerning student progress.

The policies of the Problem-Solving Approach to Algebra are guided by the professional standards established by the National Council of Teachers of Mathematics for classroom structure, selection of instructional activities, and organization of the teaching day.

PROGRAM OF EXCELLENCE

Grades 7-8

Principal
Dr. Anne Knight

Superintendent
Dr. Mike Vinson
Rankin County Schools

PROJECT ASSET

Contact:

Teresa Dollar,
Deborah O'Hara, Teachers
Shelby County High School
101 Washington Street
Columbiana, AL 35051
(205)669-5640

PROGRAM OF EXCELLENCE

Grades 9-12

Principal:
Beverly Hall

Superintendent
Dr. Norma Rogers

Project ASSET (Achieving Successful School Experiences Together) is a three-year pilot program designed to promote the use of cooperative learning and the identification of student learning style techniques in the classroom. The program, which was initiated by the Alabama State Department of Education, has five objectives:

(1) provide at-risk students with activities to decrease mathematics anxiety and increase higher-order thinking skills;

(2) transform the teacher's role from an information provider to a learning facilitator who encourages students to assume responsibility for their own education;

(3) make the classroom environment more "activity-friendly";

(4) improve communication and social skills of teachers and students; and

(5) encourage teachers to make greater use of cooperative learning techniques.

Project ASSET's primary goal is to promote a positive, activity-oriented learning environment that encourages achievement and success among all Shelby County High School students. To accomplish this goal, Project ASSET trains teachers to assess learning styles and to accommodate them through the use of innovative instructional methods. The Learning Styles Inventory (LSI) is administered to all of the school's 565 students, and a copy of the results is placed in the students' cumulative records so all teachers have access to them. Teachers are trained to interpret the LSI's and use the results to accommodate individual learning styles and to address special problems. Since the manner in which subject matter is presented often has more impact on student learning than the content itself, a school-based team composed of teachers who have received training in cooperative learning and student learning styles trains teachers on the presentation of content material.

During the first year of the program, teachers implemented cooperative learning and learning styles techniques in the classroom. In the second year a Building Base Support Team was formed, and during the third year teachers from the original support team conducted training for other teachers at Shelby County High School and across the state. Since the program's introduction, teachers have incorporated cooperative learning techniques in their classrooms, keeping students actively involved in the program for the entire school year. Courses which use the new methods include mathematics, science, government/ economics, and English as well as classes for students with learning disabilities.

The project stresses that students are the center of learning. It transforms students from passive bystanders to active participants in their own education, empowering them to assume responsibility for their education. Not only do the students learn subject matter through cooperative approaches, but they also develop the social and communication skills necessary to survive in today's competitive society.

MISTER GOODMATH

Contact:

Michael Rooney
Teacher
Nob Hill Elementary School
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Sunrise, FL 33322
(305)572-1240

Every Monday morning at Nob Hill Elementary School, Mr. Goodmath appears on the school's televised morning announcements with a challenging mathematics problem for each grade level. Students are invited to submit their solutions to Mr. Goodmath via the intraschool postal service, with the winners receiving special recognition from the school's administration.

The purpose of the televised challenge is to generate student interest in mathematics. It is one part of the Mr. Goodmath program, a comprehensive mathematics program designed to provide all K-5 students at Nob Hill highly motivating and challenging math experiences.

One of the primary goals of the televised Mr. Goodmath lessons is to wean students away from using a single strategy or formula to solve problems. Instead, Mr. Goodmath introduces them to an array of strategies, encouraging students to develop their own "bag of tricks." Peer tutoring by a cadre of high-achieving fifth graders (a.k.a. Goodmath Kids) is also available. By combining technology with peer learning, these videotaped lessons are also excellent vehicles for motivating interest in mathematics.

In addition to the Monday morning challenges, the Mr. Goodmath program has four other major components. Goodmath video productions are pretaped lessons that teach students alternative systems for computations. These lessons are designed to accommodate a variety of learning styles and to promote creative problem-solving strategies. Through the third component, a mathematics specialist periodically addresses classes at the request of classroom teachers. In another component, children experiencing difficulty with math are videotaped while they learn new and helpful strategies. The child's parents are then encouraged to view the tape on a VCR and apply the same strategies when helping their children. Through the fifth component of the program, math lab carts stocked with manipulatives are available to provide classes opportunities to practice mathematics concepts through concrete learning activities.

To support the Mr. Goodmath program, teachers have received extensive training from inservice sessions, workshops, and video programs. In addition to content knowledge and methodology, the training has addressed the math anxiety that many elementary school teachers experience. As a result of the training and the success of the Mr. Goodmath program, teachers report that, instead of being anxious, they now approach mathematics instruction with excitement.

PROGRAM OF EXCELLENCE

Grades K-5

Principal:
Joy Prescott

Superintendent:
Virgil Morgan
Broward County Schools

MEGSSS: MATHEMATICS EDUCATION FOR GIFTED SECONDARY SCHOOL STUDENTS

Contact:

Donna Hammett
Mathematics Coordinator
Waverley Administrative Offices
1225 Oak Street, Room 210
Columbia, SC 29204
(803)733-6239

PROGRAM OF EXCELLENCE

Grades 6-12

Superintendent
Dr. John Stevenson
Richland County School District One

The MEGSSS (Mathematics Education for Gifted Secondary School Students) program is based on the belief that thinking mathematically is a powerful, elegant way to organize both ideas and experiences. This philosophy maintains that mathematics is not only useful in science, business, and research procedures, but whenever information is organized, patterns are identified, and abstractions must be accommodated.

Another fundamental belief of the MEGSSS program is that gifted mathematics students respond to the challenge of thinking mathematically as early as sixth grade. For these students, the middle school years are especially important for their development and success in mathematics. Consequently, the curriculum for gifted secondary students should include an enriched blend of high school and college-level mathematics.

The primary objectives of the MEGSSS program are to teach students to (1) use basic mathematics concepts and applications as well as the basic language and notation of mathematics; (2) follow a mathematical argument as well as invent and report such arguments; (3) apply the axiomatic method in mathematics and have an appreciation of what this method does and does not provide; (4) comprehend abstraction, the role of abstraction in the development of mathematical theory, the power of apt abstractions, and ways in which mathematicians are led to such abstractions; and (5) experience non-trivial, relevant applications of mathematics such as model building.

The development of MEGSSS was lead by mathematician Bert Kaufman, who has promoted international interest in gifted programs and the production of a series of textbooks especially designed for gifted math students. Applying Kaufman's theories, the MEGSSS curriculum integrates high school and college-level mathematics by combining the highly abstract content usually found in college courses with the more specific content characteristic of advanced high school courses. MEGSSS also places strong emphasis on the role of logic in mathematics, an approach endorsed by the National Council of Teachers of Mathematics.

The students served by the MEGSSS program are highly motivated to study mathematics and have a strong analytical ability as well as exceptional ability to solve special math and logic problems. They are selected on the basis of test scores (95th national percentile or higher in mathematics) and recommendations from teachers, administrators, and parents.

THE HAYES COOPER CENTER FOR MATH, SCIENCE, AND TECHNOLOGY

Contact:

Lea Anne Brandon, Information Specialist
Hayes Cooper Center for Mathematics, Science, and Technology
Highway 61 North
Merigold, MS 38759
(601)748-2734

The first and only magnet school in the Mississippi Delta, the Hayes Cooper Center for Mathematics, Science, and Technology seeks to provide quality educational options by integrating computer use into every subject area. The goal of the program is to give K-6 students hands-on opportunities to explore the worlds of science. It also seeks to eliminate statistical differences in grade-level achievement and standardized test scores among black and white students by offering every student an individualized educational program tailored to meet his or her learning style and academic needs and by providing educational experiences through which children learn by doing.

The Hayes Cooper Center's primary objectives are to (1) eliminate minority isolation at the elementary level by maintaining a 50/50 racial composition; (2) boost student mastery of personal computing skills by integrating technology into every academic subject and by teaching all students, including kindergartners, the basics of computer programming and keyboard skills; (3) broaden students' knowledge and understanding of science through a hands-on laboratory approach that supplements regular classroom instruction; (4) strengthen students' mathematics skills by providing individualized instruction reinforced by computer instruction; (5) provide every student with a strong background in core academic subjects; and (6) ensure that all students receive the help they need to achieve grade-level competency in all subject areas.

Bringing together students of different social, economic, racial, and ethnic backgrounds, the Center serves 190 students from every corner of the Cleveland School District, regardless of their neighborhood school zone. All levels of academic achievement are represented in the student body, of which one-third of the students are eligible for free or reduced-price school lunches.

Grades K-3 are assigned a homeroom teacher who is responsible for presentation of all subject areas. Classroom learning centers are equipped with five to seven computing stations where students complete practice and enhancement activities or receive remedial help in math, English, writing and language skills, touch typing, and science. Younger students also rotate to the Center's laboratories for hands-on science instruction, foreign language study, media center activities, and individualized computer lessons.

Fourth through sixth graders are team-taught by teachers who concentrate on math, science, social studies, language skills, or reading. Teachers integrate the use of in-class computer stations into subject presentation and assign students independent work time at the terminals. Students also complete individualized lessons tailored to their academic progress and remedial needs at the Center's 28-station computer lab. Additional instruction is provided in the science and Spanish labs.

Operated as a close network of related but different academic areas, the success of the program rests on the cooperative relationships among Center staff.

PROGRAM OF EXCELLENCE

Grades K-6

Principal:
Dr. Jerry Kitchings

Superintendent
Dr. Buddy Strickland
Cleveland District Schools

SNAPFINGER ACADEMY OF MATH, SCIENCE, AND TECHNOLOGY

Contact:

Barry Doran
Instructional Coordinator
3770 N. Decatur Road
Decatur, GA 30032
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PROGRAM OF EXCELLENCE

Grades 4-7

Principal:
Dr. Crawford Lewis
Snapfinger Academy
(404)288-5643

Superintendent
Dr. Robert Freeman
DeKalb County Schools

Founded on the belief that every child, regardless of background or ability level, should have equal access to quality instruction, the Snapfinger Academy of Mathematics, Science, and Technology offers enriching educational opportunities to DeKalb County students in grades four through seven.

The program, which serves 240 public and private school students, appeals to students with a wide range of aptitude and interest in mathematics, science, and technology. The student body is fifty percent African-American and fifty percent Caucasian, Hispanic, Indian, and Oriental.

The major objectives of the Snapfinger program are to (1) promote a positive attitude toward mathematics and science; (2) integrate mathematics and science skills with "real life" situations in a multicultural setting; (3) integrate mathematical and scientific concepts into other content areas; (4) utilize computer technology to develop mathematical and scientific skills; (5) provide opportunities for students to demonstrate an ability to conceptualize and solve problems; and (6) give students the opportunity to learn to read, write, and speak about mathematics and science at a level commensurate with their abilities.

To achieve these objectives, Snapfinger Academy features low student-teacher ratios, flexible scheduling, and administrative support for innovative models of instruction. Interdisciplinary instructional approaches are designed to increase the extent to which science is studied, integrate mathematics and science study, and acknowledge the influence of mathematics and science in all academic disciplines. In addition to the technological skills that are integral to mathematics and science literacy, the program develops advanced laboratory and inquiry skills through guided discovery and cooperative learning groups, with teachers assisting in student-directed learning.

The curriculum is further enhanced by writing components from such programs as the Fernbank Science Center, the Science-By-Mail program, the Jason Project, the Atlanta Math Project, and Project A.I.M.S. (Activities to Integrate Math and Science).

The Academy also receives extensive business and community support. As a Partner in Education, Kaiser Permanente offers diverse programs and services to Snapfinger students including the well-child clinic, a computer club, a mentoring program, and career day speakers. The 100 Black Men of DeKalb County organization sponsors a leadership academy for middle-grade boys as well as Saturday excursions to educational, cultural, and business locations throughout the area. Georgia State University administers the Atlanta Math Project and the Georgia Institute of Technology funds and trains teachers in the implementation of the Jason Project. Volunteers include physicians, nurses, and administrative personnel.

Civic groups and other special interest groups have visited Snapfinger and found the activities, strategies and techniques to be both innovative and consistent with the President's national goals for improving education.

YES—WE CARE!

Contact:

Henry Fraze
Program Director
Pinellas County Schools
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St. Petersburg, FL 33702
(813)527-8441

Pinellas County's Yes—We Care! program is designed to increase minority representation in the engineering profession by increasing the number of minority high school graduates who have the motivation and prerequisite knowledge for college study in science and engineering. To reach this goal Yes—We Care! offers a Saturday enrichment program in mathematics, science, and engineering to sixth- through twelfth-grade minority students.

Drawing on the combined resources of the Pinellas County School Board, the University of South Florida, local industry, and the community, the program is staffed by secondary school and college instructors. They are assisted by volunteer minority pro-fessional engineers who conduct engin-eering projects and serve as role models.

Serving over one hundred minority students with math/science/engineering interests, the enrichment program is structured to provide maximum participation by, and personal attention to, each student. It meets for three hours every Saturday morning throughout the school year, providing ninety extra hours of learning to the participants. The morning is divided into math and science, computers, and engineering, which are taught at the beginning, intermediate, and advanced levels. Time is also allotted for informal sessions among students, engineers, and staff. While participation is voluntary, regular attendance is required, and the students' performance is closely monitored.

The enrichment program is designed to supplement the basic instruction provided by the regular school program.

Mathematics, science, and computer knowledge is broadened through computer-assisted instruction, and engineering and technology-oriented field trips bring subject matter alive, enhancing motivation. The program also stresses cultural awareness and communication skills.

In addition to the program's stimulating content, students are motivated by its club-like atmosphere and student competitions. They are also encouraged to pursue studies and careers in mathematics and science and to stimulate interest among their peers with similar academic interests and career aspirations.

The program's effectiveness has been proven in several ways. More students are enrolling in calculus courses, and more students are receiving college scholarships. Student participants have also won local Black History Brain Bowl competitions.

PROGRAM OF EXCELLENCE

Grades 6-12

Superintendent
Dr. J. Howard Hinesley
Pinellas County Schools

THE LEARNING CIRCLE

Contact:

Darlene Davis
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Huntsville City Schools
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Huntsville, AL 35807
(205)532-4697

PROGRAM OF EXCELLENCE

Grade 5

Teacher
Lymon Jones
(205)532-4697

Principal
Mildred Haga

Superintendent
Ron Saunders

Ridgecrest Elementary School has joined schools throughout the U.S., Canada, and Bermuda to form the Learning Circle, an innovative telecommunications project. Through this project, fifth graders collaborate with students at eight other schools in studying a common curriculum, "People & Perspectives." Sponsored by AT&T, the purpose of the Learning Circle is to develop the technological and higher-order thinking skills required for successful living in a global society.

The eight other schools participating in the Learning Circle are located in North Carolina, New York (two sites), Hawaii, Louisiana, Pennsylvania, Bermuda, and Canada.

The program has involved the integration of technology and the application of higher-order thinking skills in all phases of operation. Because communication between the sites is conducted via a computer and modem, the students are introduced to new technological skills while reinforcing the computer skills they already possess.

The class learns how to operate a modem and connect a telephone to the computer to conduct telephone research surveys. Once the surveys are conducted, the students analyze and chart or graph the data they have collected. Students apply skills in geography when identifying locations on maps and practice writing skills when recording research in their journals. Telecommunication terms become spelling words. The students also produce a videotape of their projects and *Journal of Places and Perspectives*, which contains their research material depicting a micro-global society.

The surveys conducted in the study of "People & Perspectives" also foster global awareness by revealing more similarities than differences among people. For example, pizza has been found to be the favorite food of students from Hawaii to Bermuda to Alabama to Canada. In addition, the project results in high levels of achievement and improved self-esteem, particularly among learning-disabled students, and all students develop poise from meeting a variety of visitors, including television camera crews.

Community support for the project has included participation in telephone surveys by local industries and contributions of materials for informational packets exchanged with other schools from the Chamber of Commerce and the Alabama Space and Rocket Center.

As a result of the success of the Learning Circle, the project is being implemented by nine other schools during the 1991-92 school year.

COMPUTER CONNECTIONS

Contact:

Cynthia Richardson
Teacher
Marion Elementary School
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Marion, SC 29571
(803)423-8345

Research indicates that interest in writing declines at the fifth grade level and that students at this age need to develop the ability to interact with technology. Studies have also shown that scores in writing on standardized tests are lower than scores in most other areas. Survey data indicates that over half the students at Marion Elementary School chose writing as their least favorite subject and that less than ten percent had access to home computers. Computer Connections is a computer technology program which believes that the computer is an invaluable tool that can enhance literacy development. It was developed to help students achieve proficiency in writing and to enhance their ability to interact with technology.

The student population served by this program is composed of 565 fifth and sixth grade students representing all ability levels. Sixty-three percent of the students are minorities, 51 percent come from single-parent families, 61 percent receive free or reduced breakfast/lunch. The school is located in a rural county which has the lowest taxable income in South Carolina and in which 8.7 percent of the population has less than a fifth grade education.

Computer Connections is an innovative means of validating writing and removing some of the barriers to competent writing. It is a means of editing and printing, thereby easing the frustration and agony that children experience in rewriting. It provides a stimulus for improved writing and an opportunity to learn word processing. It is a complete writing program beginning with paper and pen and ending with a professionally bound book complete with student graphics and laminated cover. This process also provides experience in layout, graphics and editing text.

Unique projects are Big Books featuring student autobiographies, cross-cultural publications featuring holiday customs, therapeutic compositions dealing with individual problems, and learning books produced to be used by primary students. This program also allows students to use database files in research to prepare various types of publications such as travel brochures, research papers, and special interest books. Another component of the program is the student-generated newspaper.

Community involvement has been far-reaching. Parents have been involved through PTA presentations and paired writing experiences with their children. Teachers have participated in writing seminars in conjunction with professors at Francis Marion College and have met with faculty members from the junior high school and high school to implement possible connections. Community leaders have showcased student publications in their businesses. Parents and community members are made aware of this project through a computer-generated monthly newspaper published by the students. Community leaders who speak to classes provide information used in the student-created database files.

As a result of this project, reading, writing and language scores at Marion Elementary have increased, and so has parent and community involvement with the school.

PROGRAM OF EXCELLENCE

Grades 5 & 6

Principal:
Frederick Menzer

Superintendent:
Charles Bethea
Marion School
District One

WRITING TO WRITE

Contact:

Sandra Blackburn
Reading Coordinator
Education Development Center
P. O. Box 2410
Daytona Beach, FL 32115
(904)255-6475 ext. 2293

PROGRAM OF EXCELLENCE

Grade 2

Teacher
Kip Best

Principal
Roben Smith
Pine Trail
Elementary School
(904)676-5300

Superintendent
Dr. Joan Kowal
Volusia County
Schools

Pine Trail Elementary School's Writing to Write program is a computer-based writing curriculum designed to help children develop, analyze, and articulate their own ideas by making thought "visible." It teaches students to write by having them complete a sequence of computer-delivered writing units supported by off-line activities designed to help them communicate clearly to readers.

Beginning with the students' natural language experiences, Writing to Write teaches writing as a process by guiding students through the steps of planning, drafting, revising, editing, and publishing. Instruction is presented in three major stages: (1) Setting the Scene, during which concepts, goals, and expectations are introduced; (2) Rehearsing the Skill, during which students work cooperatively in pairs to practice pre-writing, planning, and drafting strategies and skills; and (3) Writing on Their Own, during which individual students perform the steps of the writing process independently.

Since writing is essentially a problem-solving activity, the curriculum teaches students to use writing tools, models, and strategies for a variety of purposes. Students learn to articulate their writing goals and to organize their pre-writing to reflect their goals. They also learn how to observe, define, describe, create, compare, narrate, and persuade.

Teachers monitor student progress by conducting formal and informal conferences and sharing sessions; evaluating student portfolios, drafts, journals, and self-checklists; and examining daily assignment sheets, teacher utility printouts, editing guides, and progress profiles.

Because the skills involved in writing are also useful in other subjects, Writing to Write can be used across the curriculum. At Pine Trail, Writing to Write activities are integrated with other language arts as well as science and mathematics. Writing to Write is also successful with students of a wide variety of abilities and interests. Most importantly, the program is helping students of all levels to overcome their fear of writing and learn to express their thoughts and ideas.

PROJECT CHILD

Contact:

Mary Gunter
Elementary Program Director
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(904)833-3180

Project CHILD is a research and development project designed to prepare students to become productive citizens in an increasingly technological society. By integrating computer technology into the curriculum, Project CHILD enables children to learn through interactive learning experiences. The project's goal is to make more students successful learners by increasing their competence in reading, writing, mathematics, critical thinking, and problem solving.

Serving approximately 1,200 K-5 students in eight Okaloosa County elementary schools, Project CHILD is based upon a restructured elementary school environment including primary and intermediate grade learning-center clusters. Teachers in each cluster specialize in a subject area and work as part of a collaborative team of three teachers. They teach the same students (K-2 or 3-5) in their developmental cluster for three years. Learning stations within the classroom provide a variety of learning activities. A computer station houses three to six computers used daily in each subject. Teachers are trained to use computer software as an integrated learning tool rather than a supplement.

Computers are used to motivate and empower students by providing interactive activities, reinforcement, specific feedback, and individual tutoring—all factors strongly associated with academic success. Their multi-sensory/multi-media capabilities also accommodate individual learning styles and developmental differences while balancing process and product.

To accomplish its objectives, Project CHILD

(1) integrates high-quality software into the reading, language arts, and mathematics curricula;

(2) increases the amount and equity of student access to computers;

(3) empowers students to be responsible for their own learning and transforms the role of teacher into that of a content specialist, guide, and facilitator;

(4) consolidates learning objectives into focused units of instruction to meet basic skill accountability; and

(5) provides varied activities to accommodate children's developmental characteristics and learning styles.

Initiated by teachers Diane Holman and Minette Cranford of Valparaiso Elementary and Assistant Superintendent Mabel Jean Morrison, the implementation of Project CHILD in Okaloosa County has been conducted in cooperation with Florida State University. The project's advisory board is comprised of representatives from the university, the school district, and the business community. Parents serve as volunteers in the classroom, and principals and teachers serve as research partners, meeting frequently with project staff and evaluators to provide input and make suggestions for improvements.

PROGRAM OF EXCELLENCE

Grades K-5

Superintendent
Pledger Sullivan
Okaloosa County Schools

QUALITY PROGRAMS

ROBOTIC HAMBURGER FACTORY

Bellingrath Jr. High School
Montgomery County
Grades 7-9

The Robotic Hamburger Factory uses teamwork and a machine building project to give Bellingrath Junior High School students practical experience in science, mathematics, and vocational skills. Inspired by the findings of the U.S. Department and Labor's *Manpower 2000*, a major objective of the project is to motivate African-Americans, Hispanics, and females to choose careers in the fields of mathematics, science, and technology.

Twenty-two seventh, eighth, and ninth graders from vocational and academic classes work together with seven volunteers from the Society of Manufacturing Engineers and two teachers to design and build a completely automated robotic hamburger factory. The students are divided into five teams: warehousing, manufacturing, heat-treatment, assembly, and accounts receivable, each of which is led by a volunteer engineer. The teams meet for two hours after school twice a week, with the teachers overseeing their progress.

Equipment for the project is either purchased with a grant from the Society of Manufacturing Engineers or borrowed from local industries.

By enabling them to work collaboratively with professional engineers, the project encourages students to recognize the value of education in preparing for a rewarding career. The project also gives academically unmotivated vocational students the incentive to enroll in academic courses to achieve future goals, such as careers in the vocational arts and sciences. Another benefit of the project's collaborative approach is that academic and vocational students gain mutual respect for each other's talents and knowledge as they work towards the completion of a task.

QUALITY PROGRAM

Principal: W.P. Thomas
Bellingrath Jr. High School
3488 South Court Street
Montgomery, AL 36105

Superintendent
Thomas Bobo

Contact:
Bonnie Dellner
(205)269-3623

PALS: PRINCIPLE OF THE ALPHABET LITERACY SYSTEM

Educational Development Center
Volusia County
Grades 9-Adult

The Principle of the Alphabet Literacy System (PALS) is an interactive instructional program that combines the power of the personal computer with the display capabilities of videodisc technology to teach functionally illiterate adolescents and adults to read and write.

To develop their language and writing skills, students complete a sequenced plan of instruction in the PALS learning center, which is equipped with a variety of instructional technology. A computer-videodisc program systematically guides the students through the course, with instruction reinforced by computers, word processors, and journals. Typewriters are used for training in touch typing as well as developing vocational skills, such as composing resumes and completing job applications.

Located in each of the district high schools, the PALS program has achieved extraordinary results. Average gains for reading are approximately 3.2 grade levels after 20-30 weeks of participation in the program. Students' self-esteem, writing, and job seeking abilities have also shown marked improvement.

In collaboration with Daytona Beach Community College (DBCC), the PALS program in the high schools has been extended to include adults. Interested Volusia County Schools' non-instructional employees attend as well as DBCC adult education students.

QUALITY PROGRAM

Superintendent
Dr. Joan Kowal
Volusia County

Contact:
Sandra Blackburn
Reading Supervisor
Educational Development Center
P.O. Box 2410
729 Loomis Avenue
Daytona Beach, FL 32115-2410
(904)255-6475

QUALITY PROGRAM

Superintendent
Dr. Joan Kowal
Volusia County

Contact:
Sandra Blackburn
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WRITING TO READ

Educational Development Center
Volusia County
Grades K-1

Writing to Read is a computer-based instructional system designed to develop the writing and reading skills of kindergarten and first-grade students. The theory behind the program is that, since reading and writing are interdependent processes, children learn to read best while being taught to write.

The program is housed in the Writing to Read Laboratory, a learning center equipped with computers and language arts materials organized as learning stations. At each learning station, students are provided multi-sensory instruction in an interactive, self-paced format. The students see, hear, say, and type sounds and words in a set of ten instructional cycles.

Because students learn at different rates, the program also provides individualized review and reinforcement activities, and students track their own progress with a progress chart. While students practice their skills, their teacher functions as an educational manager, facilitator, and coach who observes, tutors, evaluates, and monitors their progress, ensuring that each student's learning needs are being served. Evaluations of achievement are made through teacher observations and student portfolios.

Over 5,000 Volusia County students participate in the Writing to Read program. All kindergarten children attend the Writing to Read Laboratory daily, and first graders attend when scheduling permits.

QUALITY PROGRAM

Principal
Jim Robinson

Superintendent
Robert Freeman
DeKalb County

Contact:
Gail Nielson
Computer Specialist
Murphey Candler
School
6775 S. Goddard Rd.
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COMPUTERS IN ELEMENTARY EDUCATION

Murphey Candler School
DeKalb County
Grades K-6

The faculty at Murphey Candler School recognize the importance of being at ease with technology. Accordingly, technology has become an integral part of daily life at the school, where computers can be found in every classroom, including kindergarten, special education, speech, and discovery classes.

Through the Computers in Elementary Education program, students learn to gather, store, sort, analyze, and interpret data. As they become more skilled with the computer, the students become less dependent on teachers for information. Students who are at ease with the computer thrive on the information they receive and generate themselves. They also develop and refine their own skills through various software packages, such as writing, research, and programming software. To ensure that students have access to the most effective computer programs, a software committee selects software meeting curricular requirements.

Taking advantage of the computer's word processing and desktop publishing capabilities, students create a variety of publications, including classroom and club newsletters; books; the school's newspaper, *The Weekly Bulletin*; and invitations, welcome banners, and letters for Grandparents' Day.

COMPUTER TECHNOLOGY

Northside Elementary School
Coweta County
Grades K-5

At Northside Elementary School, technology is used to introduce and reinforce important skills and concepts in all academic areas and to meet the needs of all students, including students in gifted, regular education, basic, resource, and special education classes.

Northside provides computers in three areas: the fully automated media center, the Writing To Read Lab, and the network lab. In the Writing To Read lab, computer-based instruction develops the writing and reading skills of kindergartners and first graders. In the network lab, students work independently on activities designed to reinforce and enrich language arts, mathematics, science, social studies, critical thinking, decision-making, and creative writing skills.

To meet the needs of all students, software is available in a variety of difficulty levels, and programs offer individualized instruction. In addition, teachers can alter programs, add supplemental materials, and track students' progress with computer-based record-keeping tools.

All 468 of Northside's K-5 students utilize one or more of the computer labs twice weekly, and 98 percent of the school population, including faculty and staff, are computer literate.

QUALITY PROGRAM

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Superintendent
Bobby Welch

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INTEGRATED LANGUAGE ARTS INSTRUCTION

Coffee County
Grades 9-12

Developed by teachers trained to use technology as an extension of the language arts curriculum, the Integrated Language Arts Instruction program motivates reluctant writers and teaches students to become fluent and effective writers.

Following a plan developed by the language arts department, teachers develop units of instruction, integrating several software packages and encompassing a variety of curriculum objectives. The curriculum is based on the whole language approach, and activities are structured to foster process writing skills.

The scheduling of students into the school's computer laboratory is done several weeks in advance, with language arts teachers working as a team to ensure that lab activities are effectively integrated with classroom instruction. Four language arts classes are designated as lab classes each period, and students are scheduled into the lab a minimum of 22 days per semester to complete process writing and whole language activities. The program ensures that all students receive at least one semester of computer instruction prior to graduation.

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QUALITY PROGRAM

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TOUCHING TOMORROW TODAY

Randolph Middle School
Randolph County
Grades 6-8

A collaborative effort among the computer teacher, media specialist, principal, and district media director, Touching Tomorrow Today offers Southwestern Randolph Middle School students a state-of-the-art technological education. The philosophy behind the program is that technology is an effective means to model the workplace of tomorrow, take advantage of students' attraction to multi-media operations, and minimize record keeping and enhance communication for school faculty.

Through the Touching Tomorrow Today project, students are able to log on to networked computers, retrieve and operate instructional courseware assigned to them on a menu, use a word-processing program, and save their data to diskettes. Students are also able to locate information on a CD-ROM reference (encyclopedia, dictionary, atlas), search for books on an on-line card catalog, and check out books with an automated circulation system. Students also gain valuable work place experience by assisting administrators update school databases.

In addition to being able to assign instructional courseware to individual classes and students, teachers have access to a variety of instructional support technology, including a video retrieval system, a laser disk player, a video projector, a poster maker, CD-ROM reference materials, a scanner, and laser and/or color printers. They are also able to use technology for maintaining gradebooks electronically, word processing, on-line card cataloging in the classroom, and accessing electronic bulletin boards. Administrators make use of Phonemaster, networked management information systems, word processing, electronic mail, and software designed to manage textbook inventories.

QUALITY PROGRAM

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PROJECT SCIENCE KIT

Greenville County
Grades K-5

Project Science Kit was developed on the research-endorsed premise that hands-on science activities are the most effective means of introducing science concepts and processes to students, particularly female, minority, and at-risk children. Because students are more likely to comprehend and retain what they learn through hands-on experiences, they develop better attitudes toward science, are more inclined to continue academic training in science, and become more scientifically literate citizens.

Designed and written by elementary teachers, Project Science Kit is a kit-based science curriculum based on the scientific method of problem solving. Each quarter of the school year, teachers participating in the program receive a different kit containing a curriculum unit and teacher's guide; a journal for each student to record hypotheses, data, and conclusions; and support materials designed to assist students conduct investigations. Each curriculum unit contains at least twenty science activities, providing students two hands-on learning experiences per week.

Project Science Kit serves K-5 students, ranging from academically gifted to remedial students, who attend urban, suburban, and rural schools. Their participation in the program results in improved critical thinking and problem-solving skills; improved attitudes about science; enhanced self-concepts through success in science investigations; improved scores on tests measuring scientific reasoning and manipulation of science tools; and increased practical applications of scientific concepts.

PROJECT PEAK

Mobile County
Grades K-8

Project Peak was developed to bring Mobile County children from different social, economic, ethnic, and racial backgrounds together in an educational climate of unity, acceptance, and challenge. The project's goal is to raise the children's self-esteem by helping them improve their performance in the classroom and on standardized tests and to promote interest in mathematics and science careers.

The project involves Chickasaw Elementary School of Mathematics and Science and Clark Middle School of Mathematics and Science, which have recently converted to a magnet school model. Organized according to the developmental learning stages of children, instruction at Chickasaw Elementary School features the discovery method,exploration of concepts, intensive phonics instruction, and a student-centered natural science museum. Supplemental instruction is offered through regular trips to the Basic Learning System Lab, which enhances mathematics and reading/ language skills, and the Research Writing/Compton Lab. The focus at Clark Middle School is on scientific inquiry, which is reinforced by computer technology and regular scheduling into the Basic Learning System Lab, Research Writing/Compton Lab, and Physical Science Lab.

To stimulate interest in mathematics and science careers, teachers emphasize the application of scientific theory and introduce students to practitioners in the fields of mathematics and science through partnership and mentoring activities. Selected from student career-oriented interest inventories, such fields as engineering, chemistry, medicine, electronics, biology, and communications are represented.

QUALITY PROGRAM

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THE NORTH CAROLINA PROJECT FOR REFORM IN SCIENCE EDUCATION

Grades 6-8

Through the North Carolina Project for Reform in Science Education (NCPRSE), students and teachers become co-investigators into the nature and knowledge of science. The program serves 1,700 middle school students of all ability levels in seven urban and rural sites across North Carolina.

NCPRSE is implemented through a year-long carefully sequenced presentation of concepts from the four science disciplines: biology, chemistry, earth science, and physics.

Based on research conducted by such noted education theorists as James Galligher and Joe Novack, the curriculum features student-oriented activities stressing understanding of concepts and links among knowledge. Students work on projects individually, with classmates in cooperative groups, with teachers as co-investigators, and with parents in special home-based projects.

The NCPRSE program is a National Science Teachers Association initiative awarded to East Carolina University and the University of North Carolina at Wilmington as agents effecting change in science education. Through NCPRSE, the universities collaborate on the development of curriculum, inservice training, project implementation, technology, and family interaction.

QUALITY PROGRAM

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QUALITY PROGRAM

SCIENCE IS FUN: SCIQUEST

China Grove Middle School
Rowan-Salisbury District
Grade 8

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Joyce Wells

Superintendent
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Developed in the belief that, if learning is interactive, test scores will take care of themselves, SciQuest is an in-depth, hands-on, and self-paced science course. SciQuest seeks to motivate students to become lifelong learners by emphasizing higher-order thinking skills, rather than rote memorization, and by showing all 200 eighth-grade students at China Grove Middle School that science is fun.

Because the vast majority of middle school students are tactile learners, the program concentrates on hands-on activities to increase students' retention, synthesis, analysis, and application of concepts. Organized in a modular format, instruction covers all skills identified in the North Carolina Basic Education Plan as well as enrichment activities in physical science, ecology, genetics, and environmental studies. The program also features modules for slow learners that address the same concepts and interests studied by more advanced learners.

A unique feature of the program is the school's aquaria center, which contains fresh water tanks, salt water tanks, and touch tanks. SciQuest also enables students to apply what they have learned in the classroom on field trips, including a trip to the Atlantic coast, where students complete activities integrating their knowledge from all subject areas.

QUALITY PROGRAM

MATH LITERACY EQUATION FOR SECOND GRADE

Red Bug Elementary School
Seminole County District
Grade 2

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Superintendent
Robert Hughes

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The Math Literacy Equation for Second Grade program is a prototype of National Council for Teachers of Mathematics standards for teaching mathematical concepts to young children. In this program, developmental instruction and cooperative learning techniques foster successful educational experiences and positive attitudes toward mathematics.

Rather than relying on pencil and paper tasks, the Math Literacy Equation program features a hands-on, minds-on approach incorporating the use of manipulatives and oral language into instruction. Students work in groups while learning at the concrete level, and abstract concepts are addressed through one-on-one instruction. Mathematics concepts are taught through a process of associating language with manipulatives, to help the learner form an internal picture of the math skill to be performed. When the manipulatives are removed, the language prompts the correct execution of the math skill. This strategy serves both the gifted learner and the disabled learner equally. Because failure is almost impossible, students develop positive attitudes toward mathematics.

Having established a firm foundation in mathematics, students who complete the Math Literacy Equation program continue to do well in mathematics as they progress through the upper grades. The most significant contribution of the program, however, is its impact on students' attitudes towards math. Without exception, participating students list math as their favorite subject and their most successful endeavor in school.

TAKE A CLASS OUTDOORS (TACO)

Booneville High School
Booneville District
Grades 8-12

The science teachers at Booneville High School believe that students learn best by doing. They also believe that participating in a variety of hands-on activities conducted in natural surroundings by positive role models will motivate female students to learn more about science and to consider the field of science as a career choice.

Through the Take A Class Outdoors project, female students participate in one of four stimulating field trips. The first is a trip to Tishomingo State Park, where students spend one night and two days studying botany, herpetology, entomology, astronomy, and ecology with university professors. During the second session, students tour the University of North Alabama and Mississippi State University, guided by science department professors. The third session is a three-day field trip to J. L. Scott Marine Education Center on the Mississippi Gulf Coast. There the girls participate in shark dissection, tour Ship Island, study sea turtles and horseshoe crabs, view marine life under a microscope, and learn about chemical balance in the water. During the final session, the girls trawl in Mobile Bay, hike through the swamp at Fort Gadsden Historical Site in Apalachicola National Estaurine Research Reserve, snorkel with manatees at Crystal River, Florida, and float down Rainbow River.

TACO teaches young women the importance of preserving biological diversity and how they can protect the environment and preserve natural resources. Over 200 girls, ranging from gifted to educationally handicapped students, have participated in the Take A Class Outdoors project.

QUALITY PROGRAM

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GENERATING EXCELLENCE IN MATHEMATICS AND SCIENCE (GEMS)

Dade County Schools
Grades 4-6

By providing high-interest instruction from specially trained teachers, the Generating Excellence in Mathematics and Science (GEMS) program seeks to motivate inner city youth to pursue more rigorous secondary school academic courses in preparation for careers in mathematics, science, and technology.

Through the GEMS program, students spend 75 to 90 minutes a day studying mathematics and science presented in an integrated format. The extended period of instruction fosters a broader and more in-depth study of mathematics and science and provides time for a hands-on approach to learning. By integrating mathematics with science instruction, the program also enables students to perceive practical applications of mathematical concepts.

The teachers participating in the program are dedicated professionals who are proficient in their subject areas and whose teaching fosters positive student attitudes toward math and science. Intensive in-service training in math and science as well as motivating support materials and activities are provided.

In addition to demonstrating statistically significant gains in math and science achievement and improvement in attitudes toward math and science, GEMS students are also much more likely than non-participants to enroll in higher-level mathematics and science classes in secondary school.

QUALITY PROGRAM

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QUALITY PROGRAM

DEEP ACCELERATED MATHEMATICS PROGRAM (DAMP)

Dade County Schools
Grades 8-11

Superintendent
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The Deep Accelerated Mathematics Program (DAMP) matches motivated, talented students with dedicated, talented teachers in accelerated summer mathematics courses. The primary purpose of the program is to increase the number of students, particularly female and minority students, enrolling in higher-level mathematics courses.

DAMP courses cover all the objectives of year-long honors courses in Algebra I, Geometry, Algebra II, Discrete Mathematics, and Pre-Calculus through intensive six-week programs of study. Students spend five hours in class each day and are expected to dedicate another three to four hours each evening on homework assignments.

The students enrolled in DAMP generally fall into two classifications: students who have outstanding mathematical ability and wish to further their education and students who are beginning to show promise and wish to enter the fast track of mathematical development. Because of the low teacher-student ratio, strong student motivation and teacher dedication, DAMP meets the needs of both types of students. Participation in the program enables students to accelerate their mathematics education by as much as two years, a particularly useful benefit for "late bloomers."

Over 675 students completed the DAMP program during the 1991 summer term; about 3000 students have benefited from this program since 1983. Significant increases in the enrollment of female and minority students in upper-level mathematics courses have been attributed to DAMP.

QUALITY PROGRAM

CURRICULUM DEVELOPMENT THROUGH TECHNOLOGY

Darlington County Schools
Grades 7-8

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The Curriculum Development Through Technology program teaches junior high students to develop units of instruction, while at the same time learning a variety of technological skills.

In this program, seventh- and eighth-grade students of all ability levels design an enrichment curriculum to be used by their peers as a supplement to classroom teaching. To develop materials, the students use a variety of technology, including computers, Microsoft Works, HyperCard, a video camera, a video disk player, scanners, an LCD clear view panel, and a compact disk player.

In addition to preparing students to function in an increasingly technological society, the program also offers students a unique opportunity to teach other students. Students also develop higher-level thinking, communication, and problem solving skills.

COMPUTER-BASED INSTRUCTION

Central High School
Phenix City Schools
Grades 9-12

The philosophy behind the Computer-Based Instruction project reflects the principal goal of the Phenix City School system: helping all students to reach their highest potential. To accomplish this goal, the Computer-Based Instruction project uses the computer's diagnostic, remedial, and enrichment capabilities to identify student learning styles, address weaknesses, and enhance strengths.

The Computer-Based Instruction project's computer lab is outfitted with 31 personal computers linked to a network. In addition to instructional software, the network includes WICAT software, which provides diagnosis, prescriptions, instruction, remediation, and monitoring of student work. Math instructors schedule regular class visits to the lab throughout the year to supplement classroom instruction. Nine additional computers link each math classroom to the courseware network; therefore, if scheduling conflicts preclude bringing students to the computer lab, a teacher can bring the lab to the classroom.

Computer-based instruction in mathematics, science, language, and reading ranges from remedial to enrichment instruction. As remedial students study basic skills in preparation for the Alabama High School Graduation Examination, algebra students explore the concept of a slope or positive and negative numbers.

In keeping with the project's goal of serving all students, not just advanced and remedial students, almost all of Central High School's ninth-twelfth grade students participate in the Computer-Based Instruction project. The broad-based mathematics component, alone, reaches over 1,000 students—or 90.3 percent of Central's total enrollment of 1,230.

The Computer-Based Instruction project is supported by the Mead Corporation, which provides the computers, peripheral equipment, and software.

QUALITY PROGRAM

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ENVIRONMENTAL RESOURCE CENTER

Lake County Schools
Grades 5, 7, 10

The goal of the Environmental Resource Center project is to heighten the environmental awareness of elementary, middle, and high school students through field trips and hands-on experiences. Established to provide district and community environmental education, the Environmental Resource Center also serves as a training center for teachers and a clearinghouse for environmental information and materials.

Every year fifth-, seventh-, and tenth-grade classes each take a one-day field trip to the Environmental Resource Center. There they use the equipment in the Center's extensive laboratory, take trips aboard either the 34-foot floating laboratory or the 24-foot Carolina Skiff, and participate in a shoreline wade to examine environmental features. Throughout their investigations, students observe, collect, and analyze organisms, applying a variety of field-study techniques. They record their observations and sensory experiences in journals, creative writing exercises, and drawings of wildlife. Follow-up activities are provided in *Waterworks*, a program guide containing studies that can be replicated in the classroom.

Popular with teachers and students alike, the Environmental Resource Center program has received statewide recognition for promoting environmental awareness.

QUALITY PROGRAM

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QUALITY PROGRAM

PROCESS WRITING

Volusia County Schools
Grades K-12

In the Process Writing program, the computer functions as a writing tool, enabling students to communicate their ideas and demonstrate their creativity, while at the same time developing computer skills. Promoting and improving writing through all grade levels, the program serves every student in the Volusia County district.

Process Writing begins in kindergarten with the Writing to Read program. The program is continued into first grade through a six-week review in the Writing to Read Laboratory, with writing instruction reinforced with the aid of classroom computers and printers. Throughout elementary school, students practice the writing process—prewriting, drafting, conferring, revising, and publishing—by composing stories and reports on computers. Keyboarding skills are emphasized in fifth grade after students have developed their handwriting skills. The Process Writing program continues into secondary school, as students progress to longer manuscripts and documented papers. All middle school, junior high, and high school English classrooms are equipped with computers and printers, and several high schools have computer-equipped writing centers. Every student in grades K-12 maintains a writing folder, containing a minimum of two computer-generated written pieces each nine weeks.

Operated by the district language arts department, the Writing Process program involves all elementary and English teachers. Two teachers on special assignment provide ongoing in-service training in computer-assisted writing and monitor the program.

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QUALITY PROGRAM

ENVIRONMENTAL STUDIES ON THE ROAD

Oak Mountain Elementary School
Grades 3-5 (gifted)

The Environmental Studies on the Road enrichment program strives to create independent learners by providing gifted students the tools with which to seek knowledge. In this program, students conduct field studies of school and surrounding environments to heighten their awareness of wildlife and conservation. A multidisciplinary approach, the program seeks to promote global awareness, creative and analytical problem solving, research and organization skills, and meaningful learning through direct experience.

The On The Road program begins with a six-week in-depth study integrating history, geography, research, deductive reasoning, and creative writing with the study of wetlands, geology, and endangered species. On-site investigations are then conducted on wetlands, caves, and other land forms and include field trips to Dauphin Island Sea Laboratory to study oceanography, marine biology, and environmental issues and to Bear Creek Educational Center for geological studies. Students record their observations in journals and conduct experiments assisted by parents, guest lecturers, and other experts.

Although Environmental Studies on the Road targets gifted students, the program also serves other Shelby students through classroom resources developed by parent-staffed enrichment teams charged with providing activities of interest to all students.

Pioneered by Oak Mountain Elementary, the On The Road program is now offered at three other Shelby County schools.

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OUTDOOR CLASSROOM

Talladega High School
Talladega City Schools
Grades 9-12

QUALITY PROGRAM

The purpose of the Outdoor Classroom and Arboretum program is to provide students with a hands-on approach to the study of science, while at the same time developing more positive self-images and promoting student, faculty, and community pride in an aesthetically pleasing school campus. Targeting high school students, the program seeks to involve students as actively as possible in their own learning processes and to motivate low achievers through innovative teaching methods.

In the Outdoor Classroom and Arboretum program, an area on the school grounds serves as an outdoor laboratory for hands-on reinforcement of the scientific concepts and principles taught in the classroom. In the "Sponsor a Tree for Alabama" project, for example, the students study ecological concepts in the classroom, then put those principles to practice by planting and caring for trees on campus. The students also donate funds to purchase trees, and the community donates the materials necessary for the trees' proper care and maintenance.

The majority of the students participating in the program are also enrolled in vocational classes, which designed and built the Outdoor Classroom and Arboretum as well as the plaques awarded to each tree and materials donor.

Not only has the Outdoor Classroom been instrumental in increasing ecological awareness and in motivating low-achieving students to excel in science, but, since the beautification program began, more students help maintain the cleanliness and beauty of their campus, and vandalism of school property has decreased.

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COOPERATIVE LEARNING

Union Hill Elementary School
Morgan County Schools
Grade 6

QUALITY PROGRAM

Through Union Hill Elementary School's Cooperative Learning program, students *learn how* to work effectively, collaboratively, and responsibly by working together in small groups. The program, which serves 27 sixth graders, ranging from special education to gifted students, seeks to increase student achievement by enabling students to collaborate on a variety of activities and enabling the teacher to attend to every ability level within the classroom.

At the beginning of the school year, students are introduced to cooperative learning by being assigned simple tasks that they complete individually, then in small groups. Once the students understand the process and advantages of cooperative learning, student groups complete harder, more intricate tasks, culminating in four-week studies of major curricular topics. The classroom is organized to accommodate open discussions during which students exchange ideas progressing from "cluster" ideas to "group" ideas. They are assisted by resource materials and volunteers, who facilitate the process by providing supplemental information on a topic; modeling skills such as brainstorming, rewriting and editing; and/or providing critical assessments of the students' work.

In addition to increasing time on tasks, the cooperative learning approach has fostered risk taking with new and creative ideas and built positive attitudes toward learning. Through their interactions, students have learned to respect other students' perspectives and to recognize that all group members are important and responsible for the completion of each task. Students have also learned that they are able to learn from their peers as well as from their teachers.

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QUALITY PROGRAM

MATHEMATICS PROGRAM

Vestavia Hills High School
Grades 7-12

Begun during the 1970s, Vestavia Hills High School's Mathematics Program is designed to motivate talented students to excel in mathematics by providing them with an enriched curriculum. In addition to helping students sharpen their skills, the program seeks to promote interest in the study of mathematics and to encourage students to consider careers in mathematics.

The Math Program annually serves 75-100 students in grades seven through twelve, all of whom have above average academic ability and interest in mathematics. Students participate in the program during their free time before school, lunch time, and after school, with most spending two hours a day studying math. Tenth-twelfth graders meet daily at 7:15 a.m. for an enrichment class in advanced mathematics and mathematics theory, where they study such topics as pass points, Stewart's Theorem, and vectors in space. They earn course credit and are taught through lecture and practice and by working for accuracy and speed. They continue their studies during the summer by working with a teacher for three hours each week and completing weekly home assignments.

Students also compete in Saturday mathematics tournaments throughout the school year and attend the National Mu Alpha Theta Convention for a week in August. Plans are underway for Vestavia to host its own math tournament as well as the national Mu Alpha Theta Convention.

Funds for the Mathematics Program are provided by a parent booster club, local businesses, and corporate sponsors. The major fund raiser, an annual Rotary Club Roast, has featured such famous personalities as Ray Perkins, Bart Starr, Joe Namath, Pat Dye, Governor Guy Hunt, and Paul Finebaum.

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Principal
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QUALITY PROGRAM

OPEN-AIR CLASSROOM

Houston Elementary School
Grades 2 & 5

In the fall and spring, the Talladega National Forest becomes a classroom and the rangers become teachers for 500 elementary school students. A collaborative effort between teachers, forest rangers, and community volunteers, the Open-Air Classroom provides Talladega City Schools' students with both a hands-on education and an ideal environment in which to learn science.

Teachers plan the Open-Air curriculum and coordinate instruction with the forest rangers, who teach lessons on the forest, wildlife, and safety. Students are introduced to such skills as how to read a map, how to use a compass, and how to determine the age of a tree without cutting it down to count the rings. The rangers also include high-interest topics, such as the evolution of hunters' tools, and demonstrate the use of a fire shelter.

A hands-on approach to learning is used almost exclusively in the Open-Air Classroom. During lessons, students are allowed to examine fire-fighting tools and to touch live fish and identify fish body parts. When the lessons are completed, the students, teachers, and volunteers hike in the forest and around Lake Chinnabee, applying their new-found knowledge and skills.

Local garden club members also participate in the program as chaperones and nature trail guides, teaching children to observe everything in nature from tadpoles to wildflowers. Other community participants include parents, who volunteer as chaperones and guides; local businesses, which donate money to defray the cost of the trip; and the rescue squad, which accompanies the classes in case of emergencies.

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COMPUTERS ACROSS THE CURRICULUM

Grantswood Community School
Jefferson County Schools
Grades K-5

In the Computers Across the Curriculum program at Grantswood Community School, technology is used to supplement instruction in mathematics, language arts, social studies, science, and problem solving. By using computers in a variety of curricular areas, students recognize the critical importance of technology and the impact it will have on future careers and develop the computer skills they will need as they progress in their education and throughout their lives.

Twenty of the school's forty computers are housed in the computer laboratory, with the remainder located in classrooms. A paraprofessional mans the computer lab and parent volunteers help with the computer-assisted instruction in the lab and in the classrooms. Every class spends one and one-half hours in the computer lab once a week studying library, reading, and computer skills. Each child also completes an individualized learning packet containing remedial and enrichment activities appropriate for his or her skill level and designed to build the child's confidence in his or her skills. While improving their content area skills, the students also refine their computer skills, which are taught by the media specialist and reinforced through implementation in the classroom and computer lab.

A significant feature of the Grantswood program is that computer use is an integral part of curriculum planning and instruction, not merely a reward for good behavior or completion of assignments. All of the school's 429 students use the computers in the lab every week.

QUALITY PROGRAM

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COMPUTERS ACROSS THE CURRICULUM

Center Point Elementary School
Jefferson County Schools
Grades K - 6

The philosophy behind Computers Across the Curriculum is that students must be prepared to function in a constantly changing technological world. The program, therefore, strives to provide students with a thorough background in technology as well as extensive hands-on computer experience.

Technological education for the 650 K-6 students at Center Point Elementary School begins with hands-on computer experiences in kindergarten. Each kindergarten classroom contains a computer system equipped with a voice box to help students learn to use the computer even before they are able to read. A computer is also located in each first-grade classroom, and a minimum of two computers are available in grades 2-6 classrooms. The emphasis of instruction is on developing critical thinking skills, fostering creativity, and meeting students' individual academic needs as identified by standardized tests and teacher observations. Lessons cover skill development in all subject areas, including computer-assisted whole language arts instruction, computer literacy, keyboard skills, and computer capabilities.

To supplement classroom instruction, grades 2-6 are scheduled into the school's computer laboratory at least one hour weekly to complete remedial and enrichment activities. Students also have an opportunity to observe practical applications of technology in the media center. In addition to a fully automated card catalog, the media center contains three computer search stations and CD-ROM technology to conduct research.

The Computers Across The Curriculum program receives extensive community support, ranging from assistance in the media center provided by volunteers to funds, computer equipment, and supplies donated by local businesses and churches.

QUALITY PROGRAM

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Superintendent
Pat Salamone

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QUALITY PROGRAM

ELEMENTARY MATHEMATICS-SCIENCE-COMPUTER PROGRAM for ACADEMICALLY GIFTED STUDENTS (AGP)

Hillsborough County Schools
Grades 3-6

Superintendent
Dr. Walter Sickles

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The Hillsborough County Elementary Mathematics-Science-Computer Program for Academically Gifted Students (AGP) offers gifted students an enriched education through the processes of vertical acceleration and horizontal expansion.

Acceleration in mathematics is achieved through the study of mathematics from textbooks one grade level above the student's present grade. Acceleration in earth, life, and physical science involves an inquiry approach to learning in a laboratory setting. Through horizontal expansion mathematics and science instruction is enriched by topics and approaches that foster a deeper, more meaningful understanding of concepts. Instruction is further expanded by providing students opportunities to apply their knowledge with computers. The school-based program is operated in a resource center where students study mathematics, science, and computer applications for two hours daily.

Demonstrating their support for the AGP program, many business partnerships fund summer school offerings, and many parents serve on committees for mathematics and science contests and fairs. In addition to forming Excel, a non-profit organization established to share information with parents and other citizens interested in gifted programs, parents have also collaborated with teachers, principals, and supervisors to develop a handbook on "giftedness," parental responsibilities, state and national guidelines, and the scope of the gifted curriculum.

QUALITY PROGRAM

IDEAL MATHEMATICS LEARNING ENVIRONMENT (IMLE)

East Coweta High School
Central Middle School
Grades 8 & 9

Principals
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East Coweta High School
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Eddie Lovett
Central Middle School
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Superintendent
Bobby Welch

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Mathematics Coordinator
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The Ideal Mathematics Learning Environment (IMLE) is designed to promote positive student attitudes toward mathematics through successful learning experiences. By upgrading the curriculum with more meaningful instruction, IMLE seeks to make the study of mathematics intrinsically motivating, thereby, encouraging students to continue to enroll in mathematics courses throughout high school.

Reflecting the vision of the National Council of Teachers of Mathematics, mathematics concepts are illustrated with experiments, manipulatives, and other hands-on activities. Student awareness of real-life applications of mathematics is stimulated through the use of technology and presentations by guest speakers from various community and business groups. To further motivate interest in mathematics, the local newspaper publishes *Ask IMLE*, which features brain-teasing mathematics problems and the names of community members who solve them.

Originally designed for students enrolled in Algebra I classes at East Coweta High School, IMLE now serves pre-algebra students at Central Middle School as well, and the number of students enrolling in mathematics courses increases each year.

SOLD ON SCIENCE

Valley Elementary School
Shelby County Public Schools
Grades K-5

The Sold On Science (S.O.S.) program at Valley Elementary School is a kit-based laboratory program which promotes discovery learning through the hands-on, minds-on approach to teaching endorsed by the National Science Teachers Association. Its objectives are to (1) increase positive laboratory experiences through activity-oriented lessons, (2) emphasize science process skills (observing, measuring, classifying, inferring, and experimenting), (3) present science technology as problem-solving tools, and (4) develop positive attitudes toward science and technology in all students, especially girls.

All of Valley's 780 students enrolled in the K-5 program participate in S.O.S., with third-fifth graders using the laboratory weekly, and K-2 classes attending on a flexible schedule. To encourage cooperative learning, the laboratory is furnished with tables rather than desks where small groups experiment with materials and concepts.

All support materials and kits are also available for check-out to regular classrooms, which often function as mini-labs. The kits, which are pre-packed by parent volunteers, contain household materials and other supplies for conducting experiments and observations related to county scope-and-sequence units.

In addition to parents, other community volunteers assisting with the program include university faculty, representatives from industry, and the local weather forcaster. Community organizations have also contributed funds to the project.

QUALITY PROGRAM

Principal
Sylvia Almond

Superintendent
Dr. Norma Rogers

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INTEGRATED MATHEMATICS

Mountain Brook Jr. High School
Mountain Brook City Schools
Grades 8-9

Mountain Brook Junior High School is implementing the National Council of Teachers of Mathematics (NCTM) Curriculum and *Evaluation Standards* with its Integrated Mathematics program. Instead of being taught in separate courses, algebra and geometry are presented in an integrated curriculum emphasizing concepts and processes. By adopting the NCTM standards, the school is aiming for improved attitudes towards mathematics, improved performance in algebra and geometry, an increase in the number of students successfully completing algebra by the ninth grade, and an increase in enrollment in higher-level mathematics courses.

The logical, sequential approach to instruction of the Integrated Mathematics program enables teachers to insert manipulative, writing, and application activities to reinforce mathematics concepts and to encourages students to hypothesize, investigate, and infer. Because the integrated approach also eliminates duplicative teaching of topics, content areas such as logic, group theory, probability, and statistics are now being taught. In addition, students are introduced to technological applications, such as spread sheets, data bases, and graphing calculators, to illustrate the connective nature of mathematics.

The role of the teacher has changed from authority figure to facilitator of learning, enabling students to assume more responsibility for their learning through student-centered undertakings such as cooperative learning and independent research. As the focus of instruction, the student becomes more actively involved in the learning process, both intellectually and physically.

Currently serving one-third of the eighth- and ninth-grade student populations, the program will be expanded to include all ninth-grade classes during the 1992-1993 school year as well as eligible tenth graders.

QUALITY PROGRAM

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QUALITY PROGRAM

COOPERATIVE LEARNING

Elmore County High School
Elmore County Schools
Grades 8 & 12

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Superintendent
Fordyce Tatum

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Mathematics Teacher
Annice Mosely
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Elmore County High School
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Elmore County Schools' Cooperative Learning program is designed to improve junior high school and high school students' mathematics skills through peer teaching. In this program, advanced twelfth-grade students teach mathematics to eighth-grade students enrolled in basic courses.

Classes of eighth graders are divided into small groups and assigned a twelfth-grade higher math student as a peer tutor. The peer tutor provides instruction in three sessions on manipulating fractions, computing basic functions with a calculator, and using scientific notation calculators. The final session concludes with a trip to the computer lab, where the peer teacher shows the eighth graders how to solve equations with a computer. Throughout instruction, peer tutors use manipulatives, technology and visual aides to illustrate mathematics concepts and operations.

During the peer teaching sessions, the adult teachers function primarily as monitors in the class.

Designed to improve the math skills and test scores of junior high school students, the Cooperative Learning program also strengthens the skills of the high school students and increases the enjoyment of mathematics for all the students participating in the program.

QUALITY PROGRAM

HUNTSVILLE INDUSTRY INITIATIVES for SCIENCE and MATHEMATICS EDUCATION

Sparkman High School
Madison County Schools
Grades 9-12

Principal
Ray Swaim

Superintendent
Joe Anglin

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Through the Huntsville Initiative for Science and Mathematics Education (HISME) teachers and professionals bring their practical experience and expertise about industry to the classroom. Serving college-bound seniors enrolled in Chemistry II courses at Sparkman High School, the program is designed to assist students plan for professional careers in mathematics, science, or technology.

Through the HISME-sponsored Summer Industrial Fellowship for Teachers, classroom teachers work in an industrial setting to gain first-hand information on industrial careers, professional activities, and job opportunities. After completing the apprenticeship, each teacher develops an action plan to aid students' career planning. Students also receive practical information about mathematics and science careers from guest speakers, including engineers and other professionals, who discuss job opportunities and requirements in the fields of mathematics and science. In addition, the students have an opportunity to learn about highly technological industries from practitioners knowledgeable about scientific technology and trends. Among the speakers who have visited with the class have been representatives from NASA and McDonnell Douglas, which helps sponsor the project.

ACCELERATED READER

Hillview Elementary School
Jefferson County Schools
Grades 1-6

Accelerated Reader is an innovative program that combines carefully selected reading lists of over 1,000 outstanding books with easy-to-use software that tests comprehension and records achievement. By enabling teachers to effectively manage a program of independent as well as group reading, Accelerated Reader encourages Hillview Elementary School students to read more books of quality and to develop a habit of reading for enjoyment.

A wholly student-centered, individualized approach to reading, Accelerated Reader allows each child to select his or her own book and to read it at his or her own pace. It also provides vocabulary builders, immediate feedback, and reinforcement. One of the innovative features of the program is the way it recognizes achievement. After a student completes a test, the Accelerated Reader awards the student points based on comprehension as well as the length and reading difficulty of the book. By calculating reading scores on the three standards of quality, quantity, and comprehension, Accelerated Reader challenges students to read more advanced books, which ultimately improves their reading levels.

In addition to giving students immediate reinforcement for their efforts, the single score system provides teachers with a time-saving yet accurate way to evaluate and record student performance and enables parents to monitor their children's progress in reading.

Over 235 students in grades one through six participate in the Accelerated Reader program at Hillview Elementary School, which serves a middle to low socio-economic population. The majority of students are of average ability, three percent qualify for Chapter I, and two percent are classified as gifted.

QUALITY PROGRAM

Principal
L. Satisfied

Superintendent
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MATH EXPLORERS' CAMP

Monroe County School
Grades 4 - 8

Monroe County's Math Explorers' Camp is a two-week summer course that integrates mathematics instruction, technology, and field trips to improve students' critical thinking skills while at the same time heightening their awareness of conservation issues concerning the Florida Keys. The objectives of the Camp are to develop higher-level mathematics skills, increase the use of technology as a tool, and provide students opportunities to work cooperatively.

Using the computer and integrated software as mathematical tools, students study probability and statistics, ratio and proportions, algebra, and number sense. They then apply their skills to real-life situations during field trips to the coast where they gather data while snorkeling and conducting shore investigations. Afterwards, with the help of computers, they analyze their data and compile their findings in research reports, charts, graphs, maps, and diagrams.

The success of the Camp is evidenced by increased numbers of student enrollments each summer as well as by parent and community involvement, local and national media coverage, and adoption of the program by several other Florida districts.

QUALITY PROGRAM

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Program Specialist
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QUALITY PROGRAM

MINI-COURSES IN SCIENCE EDUCATION

A.D. Henderson University School
Grades 6-8

Principal
Barbara Bittner

Superintendent
Jerry Lafferty

Contact:
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A.D. Henderson University School
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Students in the Mini-Courses in Science Education program learn how to protect and preserve natural resources while also learning the technological skills they will need to compete in the workplace of the 21st century. The program serves middle school students enrolled at A.D. Henderson University School, a campus laboratory school at Florida Atlantic University.

The sixth-grade course, Foundational Approaches in Science (FAST), is a highly motivational laboratory-based program designed to promote positive attitudes toward science and to develop skills in graphing, small group laboratory procedures, research, and oral scientific reporting. In seventh grade, students study biology with an emphasis on laboratory work with a microscope. They also complete mini-courses in cellular biology, ecology, classification and dissection, evolution, and plant and animal behavior. The study of ecology is enriched by video presentations and field trips to natural settings. Eighth graders study earth science mini-courses in astronomy, meteorology, mineralogy, and oceanography. In addition, all eighth graders take Florida Ecology, which covers basic ecological theory, terrestrial communities, wetlands, and the sea.

Participating students consistently score above grade level and above the national average on standardized tests, and a large percentage are selected for advanced science courses when they enter high school.

QUALITY PROGRAM

TEACHER RESOURCE CENTER

Grades K-12

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Dr. Steven Silwa

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The Teacher Resource Center (TRC) seeks to promote the study of science and mathematics by tapping students' natural interest in aviation and space. The program, which has served over 3,000 teachers and students, combines motivating classroom materials and activities with field trips to the Resource Center to provide students opportunities to observe concrete applications of the natural sciences and engineering in the field of aviation.

The TRC offers teachers a broad range of multi-media materials, including reproducible videotapes, slides, overhead masters, and computer software, most of which are contributed by government agencies and private corporations. Teaching aids include curriculum guides, experiments that can be conducted by elementary and secondary students, role-playing activities, bulletin board posters, readings and exercises, and field trip suggestions. TRC staff provide teachers individual and group training in the use and integration of the materials into the curriculum, and university faculty assist teachers in developing innovative teaching strategies.

To support classroom instruction, visits to the TRC offer students opportunities to observe demonstrations of scientific and mathematic principles, participate in hands-on applications of concepts and techniques, and conduct experiments with state-of-the-art laboratory equipment. Students may also attend one- or two-week summer workshops and academies. The TRC also serves as a gateway to numerous other resources by arranging for K-12 teachers and students to tour and observe aircraft flight lines, air traffic control towers and centers, simulation facilities, and meteorology laboratories.

PROJECT CHILD: COMPUTERS HELPING INSTRUCTION AND LEARNING DEVELOPMENT

Westside Elementary School
Volusia County Schools
Grades K-5

QUALITY PROGRAM

Project CHILD (Computers Helping Instruction and Learning Development) seeks to provide students successful learning experiences through developmental units of instruction supported by technology. The objectives of the program, which serves approximately 325 K-5 students at Westside Elementary School, are to actively involve students in the learning process and to create a spirit of cooperation and high expectations in the classroom.

The Project CHILD curriculum is presented developmentally, with critical thinking, problem-solving, and computer skills integrated into traditional curricula. A significant feature of the program is that students are assigned to a team of three teachers for three years (K-2 and 3-5), enabling teachers to better understand and meet students' needs and to monitor their long-term progress.

Classrooms are organized as clusters, with each classroom functioning as a learning center specializing in a subject area. In the daily routine, students move to the other learning centers in their cluster to spend one hour working in each subject area. Each learning center contains thematically organized instructional materials and textbooks and is equipped with computers, instructional software, and a variety of Project CHILD Learning Activities Guides.

To enrich classroom instruction, cluster teams also plan activities involving all students in special events such as field trips, holiday programs, and county fairs.

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Superintendent
Dr. Joan Kowal

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SCIENCE, TECHNOLOGY, AND SOCIETY CAMPS

Marion County Schools
Grades 6-8

QUALITY PROGRAM

Through the Science, Technology, and Society Camps program, interdisciplinary teams of social studies and science teachers conduct two-week summer camps at which students apply modern research techniques to the study of environmental issues. The goal of the program is the development of cognitive process skills and values related to science, technology, and society.

The Science, Technology, and Society Camps are held at six middle school sites, each one accommodating up to 20 students. To orient the students to science, technology, and societal issues, the teachers present the interactive videodisc ECoVision as well as instruction on a wide variety of problem-solving techniques. After the introductory presentations, the students study local science, technology, and societal issues during field trips to environmental sites. At the end of the two-week session, each camp presents an electronic report of the students' investigations, featuring videotape excerpts from their field studies, videodisc segments, and computer overlay graphics. A panel consisting of the county commissioner, the county information officer, the city council president, the city planner, and a realtor-developer responds to each camp's presentation.

To reinforce the Camps' impact, interdisciplinary activities in science and social studies continue throughout the school year.

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Ralph Archibald, III

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QUALITY PROGRAM

SCIENCE TEACHER TECHNICAL TRAINING (ST3)

Marion County Schools
Grades 6-12

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Just as post-Sputnik teacher training in the 1960s and 1970s emphasized "real life" laboratory experiences for students, the advent of the microcomputer has created an urgent need for science teachers with expertise in technology. To help teachers keep up with the accelerating changes in science and technology, Science Teacher Technical Training (ST3) provides comprehensive training and technical assistance in microcomputer applications.

The ST3 training program is presented through a spiral approach, beginning with an overview of computer applications, then moving to a structured review of available software. Computer instruction ranges from introductory training for novices to advanced training for more experienced teachers. The instruction concludes with demonstrations of computer peripherals and futuristic technology, such as modems, interactive videodiscs, and computer-video overlays.

Technical assistance is provided in a variety of forms by a cadre of teachers with expert computer skills. To assist teachers select effective instructional software, the cadre evaluates programs and probe ware for use in the classroom. It also assists science teachers with designing, creating, and sharing microcomputer-based laboratory experiments. Assistance with teacher-support tools, such as word processors, spreadsheets, and data bases, is also available.

QUALITY PROGRAM

SCIENCE-MATH OLYMPIAD

Eighth Street Elementary School
Marion County Schools
Grades K-5

Principal
Helen Ingrao

Superintendent
Ralph Archibald, III

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Eighth Street Elementary School
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The Science-Math Oympiad uses a carnival theme and format to create excitement about mathematics and science. Held at Eighth Street Elementary School's cafeteria in the evening, the Olympiad features activity centers exhibiting teacher-developed hands-on activities in mathematics and science.

To encourage family participation in learning, many of the displays contain science and math activities that parents and children can do together. The carnival format is enhanced with prizes and with hot dogs and soft drinks, which are sold to defray costs.

A wholly collaborative effort, the Olympiad involves the entire school community. K-5 mathematics and science teachers plan and organize the Olympiad, developing guidelines, timetables, lists of supplies and prizes, and PR announcements, and all teachers contribute activities. The PTA publicizes the event and gathers necessary materials, most of which are donated by local businesses. Neighborhood secondary school students distribute tickets.

COMPUTER RESOURCE PROGRAM

Sol Johnson High School
Chatham County Schools
Grades 9-12

The Computer Resource Program unifies the teaching of mathematics, English, and computer technology to provide students integrated and interesting learning experiences. Serving students enrolled in SAT review courses, creative writing, and data processing courses, the Computer Resource Program is designed to enhance problem-solving, standardized test-taking scores, computer literacy, and creative writing skills.

Resource Program computers are housed in the school's computer laboratory, where students can use SAT review software, creative writing software, word processing programs, a graphics program, a grammar check program, and a desktop publishing program. Because the computers are networked with the media center's data bank, students also have access to the University of Georgia's computer system. Thus, students are able to hone their research skills by accessing the university's research files.

The laboratory, which was established through a grant from Union Camp, is also used to teach computer skills to members of the community.

QUALITY PROGRAM

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Ola Lewis

Superintendent
Dr. Patrick Russo

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Technology Coordinator
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BUSINESS PROFESSIONS ACADEMY

Savannah High School
Chatham County Schools
Grades 9-12

Recognizing the computer's value as an educational tool and its importance in the highly competitive business world, the Business Professions Academy offers a computer applications program in all business education courses. The Academy's goal is to develop students' full potential in the field of business and to adequately prepare students for the future—whether that means college, technical school, or a job.

To provide students with a thorough background in technology, the Academy offers a wide variety of computer applications courses, including Keyboarding, Word Processing, Computer Applications, Computerized Accounting, Real Estate, Entrepreneurship, Office Simulation, Records Management, and Transcription. The students' technological training also includes transmitting and receiving documents with a fax machine and operating the latest telephone equipment in the office simulation lab.

Of the facility's five computer labs, two are networked, enabling students to share data files as well as send and receive electronic mail. In one lab students use CD-ROM equipment to research topics in an electronic encyclopedia and world atlas. A modem enables students to access local area networks and bulletin boards as well as on-line database services such as Prodigy.

The Business Professions Academy is a magnet school housed within Savannah High School. The racially balanced program serves all levels of students.

QUALITY PROGRAM

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Superintendent
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QUALITY PROGRAM

READING-WRITING LABORATORY PROGRAM

Houston County Schools
Grade 7

Superintendent
Dr. Harold Chapman, Jr.

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Houston County's Reading-Writing Laboratory Program was developed with the philosophy that each student, regardless of ability level, has strengths and weaknesses in reading and writing and can, therefore, profit from an individualized program of study.

In the Reading-Writing Program, all seventh-grade students are scheduled into the reading-writing laboratory for a nine-week period where they complete activities tailored to each student's individual needs. Laboratory instruction covers reading comprehension, vocabulary building, and reading rate as well as the writing process. The laboratory director is a reading specialist who works cooperatively with language arts teachers to individualize instruction and improve students' skills. Each laboratory is equipped with computers, printers, and software designed to facilitate the writing process, and writing instruction is reinforced throughout the curriculum and throughout the middle school years.

A required component of the language arts curriculum for all seventh-grade students in the district, the Reading-Writing Laboratory Program also actively involves students in goal-setting, pacing, selecting activities, and evaluating progress.

QUALITY PROGRAM

ALGEBRA I & II BLOCK

Gulfport High School
Gulfport Separate School District
Grades 10-12

Superintendent
Dr. W. Ray Strebeck

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Principal
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The goal of Gulfport High School's Algebra I & II Block program is to provide students with a thorough background in algebra so that they are prepared to enroll in higher mathematics courses such as trigonometry and calculus. The program serves 21 students of average to below average ability in mathematics.

In the Algebra I & II Block program, a two-hour class period is devoted solely to mathematics. With this time frame, teachers are able to abandon traditional instructional methods in favor of such strategies as cooperative learning, peer tutoring, discovery learning, and hands-on activities. The two-hour block also permits teachers to fulfill individual students' needs, build self-esteem and motivation, develop critical problem-solving skills, and facilitate independent thinking.

All of the students participating in the Algebra I & II Block program have shown remarkable mastery of mathematics concepts as well as a boost in self-confidence. Projections indicate that most of the school's graduates will complete the core curriculum.

NATURE TRAIL AND OUTDOOR CLASSROOM

East Webster High School
Webster County Schools
Grades 6-12

Built to enhance science study and to provide a setting for special math projects, the Nature Trail and Outdoor Classroom has succeeded in increasing the awareness and appreciation of the ecological system by all East Webster High School students.

The development of the Nature Trail and Outdoor Classroom involved the entire student population. Vocational students cut the posts and plaques, and special education students did the painting and construction work. Typing students typed the information for the plaques, and study hall and other classes completed other assignments. Even East Webster Elementary School students—located six miles from the high school—participated in the program by planting a magnolia tree along the trail. Parents and community members also participated in the project by contributing squirrel houses, squirrel feeders, cross ties, wood shavings, wood duck houses, bee hives, bird houses, and funds.

In the two years since it was established, the trail has inspired a variety of learning activities. Physical science students use it for measuring, calculating averages, and plotting graphs, and the biology class uses the trail to reinforce the concepts of identification, classification, research, ecology, and conservation. Biology students also conduct tours of the trail for elementary students. Non-science classes also take advantage of the trail's unique features. The creative writing class uses it as a source of inspiration, and one sixth-grade English teacher uses the trail to teach sentence construction.

QUALITY PROGRAM

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E. S.. Woodruff

Superintendent
Jimmy Powell

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Science Teacher
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SOUTH CAROLINA MAPS AND PHOTOGRAPHIC SYSTEMS (SC MAPS)

Grades 6-8

South Carolina MAPS and Photographic Systems (SC MAPS) is designed as a unique way to introduce students to South Carolina's intriguing landscape through high altitude and satellite infrared, topographic, and special purpose maps. By focusing on geological formations that have influenced the state's historical development, economic trends, and current land uses, the project seeks to heighten students' appreciation of South Carolina's natural landscape and cultural heritage.

Interdisciplinary instruction is provided in such areas as geology, geography, history, economics, and conservation of resources and reinforced through cooperative learning techniques. Using state-of-the-art cartographic and photographic technology, students examine the relationship between geological formations and land use by studying South Carolina's mountain chains, monadnocks, rolling hills, water falls, rivers, swamps, delta, barrier islands, billion-year-old rocks, and land that was once part of another continent. In addition to teaching students to recognize the historic and economic reasons for the locations of South Carolina's cities, industries, and resort areas, the program also stresses the responsibility of all citizens to preserve natural resources.

The SC MAPS program serves middle school students enrolled in earth science, South Carolina history, or gifted and talented classes.

QUALITY PROGRAM

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PROMISING PROGRAMS

LIBRARY AUTOMATION

Erwin High School
Jefferson County Schools
Grades 7-12

The Library Automation program at Erwin High School's media center provides the entire student population access to an automated card catalog and CD-ROM programs and resources. With the computerized card catalog, students can ascertain whether or not a book has been checked out and where it can be found on the center's shelves. With the aid of the CD-ROM, students can obtain information from an encyclopedia and a global atlas or access the *Reader's Guide*, which enables them to acquire magazines quickly and easily. Because the technology removes many of the barriers to successful research, students are motivated to search for information. The goal of the program is to ensure that students and faculty are effective users of ideas and information and that students are computer literate before graduating.

PROMISING PROGRAMS

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Superintendent Pat Salamone

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MODEL TECHNOLOGY SCHOOL PLAN

Huntsville High School
Grades 9-12

Armed with the Model Technology School Plan, the technology committee of Huntsville High School is collaborating with industry representatives, community members, and parents to develop the school into a technology demonstration school. The goal of the program is a curriculum fortified by technology. Through this program, fragmented computer resources have been networked for a more cost-effective operation, and classroom management and record keeping have been simplified. In addition, teachers and administrators have received extensive training in instructional applications and the integration of technology into daily life.

PROMISING PROGRAMS

Principal William Smith

Superintendent Dr. Ron Saunders

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COMPUTER-ASSISTED INSTRUCTION

Phenix City Middle School
Phenix City Schools
Grades 5-6

Through the Computer-Assisted Instruction program, fifth- and sixth-grade students at Phenix City Middle School receive individualized instruction from a computer-based integrated learning system. All students receive at least forty minutes of computer-based instruction in the 37-station networked laboratory per week, with targeted remedial and advanced students provided additional sessions. Operated by a teacher and a teacher's aide, the learning system manages, evaluates, and grades each student's work, then generates progress reports for teachers and parents.

PROMISING PROGRAMS

Principal Pansy Slocumb

Superintendent Clifford Smith

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PROMISING PROGRAMS

Principal James Dudley

Superintendent Pat Salamone

Contact: Lisa Boyd
Media Specialist
Bottenfield Junior High School
400 Hillcrest Road
Adamsville, AL 35005
(205)674-5605

PROGRAMMING AND COMPUTER LITERACY THROUGH THE MEDIA CENTER

Bottenfield Junior High School
Jefferson County Schools
Grades 7-9

The goal of the Programming and Computer Literacy through the Media Center program is to provide Bottenfield Junior High School students with as much hands-on experience with computers as possible. In addition to the computer programming class, special education students, and the News Media class, which are regularly scheduled in the laboratory, all of the school's 835 students have access to the computer laboratory through class or individual visits. To promote computer literacy and academic excellence, the laboratory provides computer-assisted instructional reinforcement, remediation, and enrichment activities for students of all ability levels. Ample inservice opportunities are also provided to teachers to strengthen their computer skills and knowledge.

PROMISING PROGRAMS

Principal Dr. Bruce Suther
Winter Park H.S.
2100 Summerfield Road
Orlando, FL 32792
(407)644-6921

Superintendent Dr. J. Donald Shaw

Contact Dr. Ronald Kirkland, Gayle Hodges, Physics Teachers

MICROCOMPUTER-BASED LABORATORY FOR PHYSICS STUDENTS

Winter Park High School
Orange County Schools
Grades 11-12

In the Microcomputer-Based Laboratory for Physics Students, eleventh- and twelfth-grade students of all ability levels at Winter Park High School perform experiments with state-of-the-art laboratory equipment. The physics laboratory is outfitted with ten computer stations, which are interfaced for distance, force, temperature, heat supply, sound, a Geiger counter, and magnetic, light, and electricity probes. The computers are also networked to two printers to enable students to print and analyze results. In the laboratory, students perform guided, but not highly structured, experiments in introductory physics. Since a computer can collect more data in minutes than the unaided student can gather in hours or days, data is generated and analyzed very quickly, enabling students to conduct several runs in a variety of approaches within a single lab period. As a result, students gain a deeper understanding of physics concepts.

PROMISING PROGRAMS

Principal Barbara Bittner

Superintendent Jerry Lafferty

Contact Dr. S. M. Tsurutome,
Director of Research
A.D. Henderson University School
500 NW 20th Street
Boca Raton, FL 33431
(407)367-3977

INTEGRATED CURRICULUM

A.D. Henderson University School
Grades 6-8

In the Integrated Curriculum Using Technology program, technology is used to bridge the gap between the abstract concepts presented in instructional materials and the concrete application of skills. This teacher-guided discovery program promotes self-management skills, cooperative learning, communication, and active participation in the learning process. Following whole-group introductions to concepts to be studied, children rotate to classroom activity stations. There the children work individually, in teams, or in groups on such projects as constructing masks and puppets, writing original musical compositions, studying foreign languages, cooking, and writing and compiling poems and stories into books. Through a joint venture between the school and IBM, a computer, printer, voice synthesizer, mouse, and headphone set are provided for every six students in the classroom. To accommodate a variety of learning styles, software such as Writing To Read; Stories and More Literature; Writing To Write; Primary Editor Plus; TLC Math; Time, Measurement and Money; Bouncy Bee; and Spelling are integrated into the curriculum.

APPLIED MATHEMATICS

Americus High School
Americus City Schools
Grades 9-12

At Americus High School, general and vocational students enrolled in the Applied Mathematics program apply mathematics concepts to real-world situations. The Applied Mathematics program is divided into units emphasizing different applications of mathematics, such as problem solving, measurement, estimation, and precision. To create a rich learning environment, instruction is enhanced by presentations by guest speakers, laboratory activities, and videos depicting math skills being used in the work place. In cooperative problem-solving projects, students working in groups explore multiple ways to derive solutions to problems.

PROMISING PROGRAMS

Principal Dr. Howard Hendley

Superintendent Dr. Ronnie Williams

Contact: Jane Butler
Teacher
Americus High School
805 Harrold Avenue
Americus, GA 31709
(912)924-3853

COMPUTERIZED GENERAL MATHEMATICS

Starkville High School
Starkville Public Schools
Grades 9-12

The philosophy of Starkville High School's Computerized General Mathematics program is that, while they learn at different rates, all students can learn; that learning is most productive when material is matched to a student's prior knowledge and ability; and that failing grades demoralize students, putting them at risk for dropping out of school. The Computerized General Mathematics program, therefore, provides positive learning experiences to low-achieving ninth-twelfth-grade students through an individualized, self-paced program of computer-assisted instruction. Designed to remedy deficient math skills as quickly as possible, the goal of the program is to enable students to progress to higher-level mathematics courses. Students perform computer-based pre-testing, practice exercises, and post-testing themselves, assisted by a teacher who provides direction, explanations, and encouragement. Because students must achieve a performance level of 80% or better for all assignments, they never receive the grade of *F*.

PROMISING PROGRAMS

Principal Dr. Russell Johnson

Superintendent Dr. Larry Box

Contact Donna Johnigan
Mathematics/Computer Teacher
Starkville High School
Yellow Jacket Drive
Starkville, MS 39759
(601)324-4130

KIT-BASED SCIENCE

Seminary Elementary School
Covington County Schools
Grades K-6

Tell me, I forget; show me, I remember; involve me, I understand.

Substantiating this ancient proverb, research reveals that people remember only 10 percent of what they hear, but 80 percent of what they experience first-hand. Accordingly, if a child is to grasp scientific concepts, he or she must have more tangible experiences than merely looking at diagrams in a textbook. Through the Kit-Based Science program, teachers are provided with the materials to conduct hands-on activities, thereby providing their students the experienced-based learning necessary to grasp scientific concepts. The Kit-Based Science program provides teachers with the background information they need to teach science with confidence in the following units: My Body, My Environment, Beginning Senses, Animals in My World, Magnets, Changes, Butterflies/Life Cycles, Introduction To Ecology, Weather, Arthropods, Chemistry, Create An Animal, Meteorology, and, Small Things (Microscope).

PROMISING PROGRAMS

Superintendent Dr. Lavahn Moss

Contact Debbie Hux
Principal
Seminary Elementary School
P.O. Box 34
Seminary, MS 39479
(601)722-3355

BEST COPY AVAILABLE

PROMISING PROGRAMS

Superintendent Donald Martin, Jr.

Contacts Cyndi Zeger
Director
Supplementary Education Ctr.
1636 Parkview Circle
Salisbury, NC 28144
(704)639-3004

HORIZONS UNLIMITED

Supplementary Education Center
Rowan-Salisbury School District
Grades K-8

Serving the Rowan-Salisbury School District, Horizons Unlimited is an educational center that provides children opportunities for learning beyond the classroom. With an emphasis on active learning, programs at Horizon Unlimited enable students to study natural science, space science, health, and history through the center's vast resources and exhibits. Providing services to nearly 8,000 students, the center sponsors after-school, weekend, and summer enrichment activities for elementary students and at least one program a year for middle school classes. Parents and other adults are invited to share in the children's learning experiences. In addition, the center provides teachers staff development training, technical assistance, and resources.

PROMISING PROGRAMS

Contacts Dr. Jackson Lee, Jr.
Prof. of Education
Francis Marion University
P.O. Box 100547
Florence, SC 29502-0547
(803)661-1460
Dr. Bill Junkin
Co-Director
Erskine College
Due West, SC 29639
(803)379-2131

ELEMENTARY SCIENCE LEADERSHIP PROGRAM

Grades K-8

Through the Elementary Science Leadership Program, elementary school teachers take summer graduate courses designed to enhance their content knowledge and instructional methodology. The ultimate goal of the program is to provide students high-quality experiences in science that expand their horizons, spark their interests, improve their thinking and problem-solving skills, and extend their range of career opportunities. The program also seeks to develop a network of trained science teachers who, serving as sources of expertise within the district, assist their peers in improving science instruction. The four courses offered in the program include science teaching methods and classroom management, life science, earth/space science, and physical science. Instruction is largely experiential, moving beyond examinations of scientific and pedagogical concepts to practical applications. Each class also introduces participants to a variety of low-cost hands-on activities that can be replicated in elementary school classrooms.

PROMISING PROGRAMS

Principal Miriam Boucher

Superintendent Ernest Mathis, Jr.

Contact Kathy Snipes, Teacher
Erlinda Broughton, Teacher
Brooklyn Springs Elem. School
502 Billings Drive
Lancaster, SC 29720
(803)283-8471

HANDS-ON SCIENCE CLUB

Brooklyn Springs Elem.School
Lancaster County Schools
Grade 6

Established in the belief that students learn best by doing, the Hands-on Science Club at Brooklyn Springs Elementary School provides sixth graders a variety of hands-on learning opportunities in a weekly enrichment program. The club, whose activities are planned and monitored by a team of three teachers, meets weekly for fifty minutes. Designed to make learning enjoyable, the atmosphere of the club is relaxed—no grades—and students are encouraged to take an active role in their learning. Through the hands-on activities, students quickly master the concepts and process skills of observation, communication, inference, metric measurement, classification, and prediction. Because active learning enables students to internalize information, they are also able to transfer their knowledge to other situations.

CHAPTER 1 MATHEMATICS	Johnsonville Elementary School Florence School District Five Grades 2-4	**PROMISING PROGRAMS**

The purpose of the Chapter1 Mathematics program at Johnsonville Elementary School is to remediate deficiencies in mathematics so that students can return to the regular classroom and progress successfully. The program serves 60 students in grades two-four, selected on the basis of test scores and teacher recommendations. In an alternative class organizational approach, the Chapter1 students are grouped by instructional rather than grade levels and provided remedial instruction to rectify diagnosed deficiencies. To facilitate planning between Chapter1 and regular classroom teachers, instruction follows the district's scope and sequence guidelines, and a student profile, documenting mastery of skills, is also provided to the teacher when a student returns to the regular classroom.

Superintendent Dr. Paul Shaw

Contact Jerry Leviner,Assistant Supt.
P.O. Drawer 98
Johnsonville, SC 29555
(803)386-2341

James Weaver, Principal
Johnsonville Elem. School
P.O. Drawer 1078
Johnsonville, SC 29555
(803)386-2955

ABOUT THE NATIONAL DIFFUSION NETWORK:

The National Diffusion Network (NDN) is a system for sharing successful education programs among public and private schools, colleges and other institutions. Administered by the U.S. Department of Education, the NDN provides funds to "diffuse," or distribute, information about exemplary programs to schools across the region and the nation.

Each state receives a grant to support the work of a facilitator who serves as a broker, matching school needs with the best educational practices. The NDN facilitator fulfills this role by:

- Aiding local schools looking for effective answers to education mandates and challenges
- Introducing exemplary programs that have been nationally validated based on data
- Documenting positive educational impact (NDN-recognized programs are based on a rigorous evaluation)
- Identifying and nominating potential programs to be shared as a national resource
- Coordinating workshops
- Arranging visits to local schools using NDN programs
- Sponsoring schools and organizations and NDN Facilitators form a resource network that helps schools adopt and adapt programs for their own use.

For more information about the network, contact your NDN state facilitator identified below. Relevant NDN projects throughout the country are included in this document and you are encouraged to contact your state facilitator or the project directly.

NATIONAL DIFFUSION NETWORK STATE FACILITATORS

ALABAMA

Alabama Facilitator Project
Alabama Department of Education
Room 5069, Gordon Persons Building
Montgomery, AL 36130
(205)242-9834
FAX (205)242-9708
Ms. Maureen C. Cassidy, State Facilitator

FLORIDA

State Facilitator Project
Florida Department of Education
School Improvement Resource Center
325 West Gaines Street, Suite 424
Tallahassee, FL 32399
(904)487-1078
FAX (904)488-6319
Ms. Judy Bishop, State Facilitator

GEORGIA

Georgia State Facilitator Project
University of Georgia
607 Aderhold Hall
Athens, GA 30602
(404)542-3332 or 542-3810
FAX (404)542-2321
Dr. Frances Hensley, State Facilitator

MISSISSIPPI

Mississippi Facilitator Project
Mississippi Department of Education
P.O. Box 771
Jackson, MS 39205
(601)259-3498
FAX (601)359-2198
Dr. Bobby Stacy, State Facilitator

NORTH CAROLINA

North Carolina Facilitator Project
N.C. Department of Public Instruction
Division of Development Services
116 West Edenton Street
Raleigh, NC 27603-1712
(919)733-7037
FAX (919)733-3791
Linda G. Love, State Facilitator

SOUTH CAROLINA

South Carolina Facilitator Project
South Carolina Department of Education
1429 Senate Street
Columbia, SC 29201
(803)734-8116
FAX (803)734-8624
Mr. Peter Samulski, State Facilitator

NATIONAL DIFFUSION NETWORK

First-Level Mathematics (Kindermath)

First-Level Mathematics (Kindermath) provides initial mathematics instruction by having students physically manipulate concrete objects.

A comprehensive program in math fundamentals, Kindermath provides diagnosis, prescription, and a sequential curriculum designed to foster individual developmental growth. The ninety lessons are presented in the nine components: same and different, patterns, sets zero to five, shapes, sets six to ten, numerals six to ten, signs, addition, and subtraction. Key elements of the program are developmental hierarchies, mixed instructional modes, and an extended curriculum range.

The entire program (including voice synthesizer) is available for use on computers requiring minimal teacher assistance. The program is also available in Spanish.

Grade Levels: Grades K-1

Contact:
Ms. Mary Alice Felleison
38 North Waterloo Road
Devon, PA 19333
(215) 687-6252

CLIMB: Coordinated Learning Integration—Middlesex Basics.

Project CLIMB: Coordinated Learning Integration--Middlesex Basics emphasizes basic skills in reading, writing and mathematics. Incorporating National Council for Teachers of Mathematics standards, the program features an enjoyable hands-on approach to mathematics instruction.

Its coordinated instructional program includes a diagnostic package identifying K-12 reading and mathematics skills; a writing package that integrates reading, writing, and thinking skills across the curriculum; survey and criterion-referenced tests to evaluate student performance; and a simplified record-keeping system for continuously monitoring progress. The management design provides a unified approach to achieving instructional goals by coordinating personnel, materials, and services; communication between classrooms and support services; and instruction across grade levels.

Grade Levels: Grades K-12

Contact:
Ms. Barbara Brenner
Director, Project CLIMB
Middlesex Public Schools
Administration Offices
Kennedy Drive
Middlesex, NJ 08846
(908)968-4494

Comprehensive School Mathematics Program (CSMP)

An underlying assumption of the Comprehensive Schol MAthematics Program (CSMP) curriculum is that children can learn and enjoy mathematics much more than they do now. To increase both the learning and enjoyment of mathematics, program content is presented not as an artificial structure, but as an extension of experiences children encounter in their development, both at the real-life and fantasy levels.

Using a "pedagogy of situations," the teacher leads children through sequences of problem-solving experiences presented as games or stories. The content is completely sequenced in spiral form so that students are brought into contact with each area of content throughout the program. As the situations become more challenging, the children build on interlocking experiences of increasinf sophistication.

A unique feature of CSMP is the use of nonverbal languages that give children immediate access to mathematical ideas and methods necessary for solving problems and for continually expanding their understanding of mathematical concepts.

Grade Levels: Grades K-6

Contact:
Ms. Clare Heidema
Director, CSMP
McREL
2550 S. Parker Road
Suite 500
Aurora, CO 80014
(303)337-0990

NATIONAL DIFFUSION NETWORK

Computer-Assisted Diagnostic Prescriptive Program (CADPP) in Reading and Mathematics

The Computer-Assisted Diagnostic Prescriptive Program (CADPP) is a database management system designed to assist teachers with diagnosis and prescription. With this system, teachers load files containing individual student characteristics (age, instructional level, learning modality), and target skills and skill-related characteristics of instructional materials, such as readability level, interest level, and learning modality. The CADPP program then generates customized learner prescriptions and individualized educational plans.

This relational database is menu-driven and requires no programming skills. Because it can be copied for multiple users in all curriculum content areas, it can be used in one classroom, by a school, or throughout a district.

Originally designed for economically disadvantaged students, the CADPP program has been successfully used with Chapter I, Migrant Programs, competency-based education, and other programs in 47 states.

Grade Levels: Grades 3-9

Contact:
Ms. Debra J. Roberson
Technology in Education
3936 West 78th Court #21
Merrillville, IN 46410
(219)769-1712

Decision-Making Math (DMM)

Decision-Making Mathematics (DMM) is a supplementary program designed to teach students a step-by-step plan for solving mathematics problems successfully. Methods used include questioning, planning, organizing data, analyzing and applying solutions. Through this program, the teacher isolates that students need to solve problems both in and out of the classroom.

Students learn to use a four-step problem-solving strategy of understanding, planning, answering, and checking; draw inferences from graphs, tables, and charts; and apply mathematics to the real world beyond the classroom. DMM emphasizes processes rather than solutions through a variety of methods including questioning and planning, interpreting and verifying, organizing and manipulating data, and analyzing and applying solutions. Cooperative learning and alternative assessment techniques are also stressed throughout the program.

Not only does DMM help students become effective decision makers, but it also hprovides teachers a vehicle for establishing a problem-solving climate in the classroom.

Grade Levels: Grades 7-9

Contact:
Ms. Laura D. Dunn
Education & Technology Foundation
4655 25th Street
San Francisco, CA 94114
(415)824-5911

Effective Videodisc Instruction in Core Mathematics Concepts

The Effective Videodisc Instruction in Core Mathematics program improves math achievement of diverse groups of learners, including regular, remedial, mainstreamed, and mildly handicapped students. Through the use of videodiscs and print materials, students are provided guided practice in mathematics concepts and systematic reviews of skills.

Using a hand-held remote controller, the teacher conducts the videodisc lesson while monitoring and reinforcing student progress. Videodisc demonstrations are fast-paced, with each demonstration including intensive questioning. If students experience difficulty, the teacher can provide additional guided practice through the videodisc. To emphasize concept development rather than rote learning, two or three sets of parallel examples are available for reteaching.

Grade Levels: Grades 5-7

Contact:
Mr. Alan Hofmeister
Technology Division
Developmental Center for
Handicapped Persons
Utah State University
Logan, UT 84322
(801)750-2603

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NATIONAL DIFFUSION NETWORK

FOR SEA: Investigating Marine Science

Capitalizing on the inherent appeal of the sea, For Sea: Investigating Marine Science uses coastal waters as an incentive to learn science. The program develops basic science skills and knowledge through an interdisciplinary, activity-oriented marine education curriculum. The purpose of the program is to equip students with the experiences and information necessary to make responsible decisions about the marine environment.

For Sea can be used as a core curriculum or as a thematic unit. Close proximity to sea water is not necessary to implement this program in the classroom.

Grade Levels: Grades 1-6

Contact:
Ms. Laurie A. Dumdie
Marine Science Center
17771 Ford Drive, NE
Poulsbo, WA 98370
(206)779-5549

GEOLOGY IS

Geology Is is an introductory geoscience course designed to make students more responsible consumers of earth materials and protectors of the environment.

Designed as a one- or two-semester course, Geology Is features units in Earth Materials, Observing the Earth, Internal Processes, and External Processes. Each unit contains text material, laboratory exercises, and objective and subjective tests. The course promotes understanding of energy, geologic hazards, land use, and geoscience processes through a broad range of materials and media, including slide-tapes, films, videotapes, and guest speaker presentations. Instruction is followed by individual and small-group investigations of topical areas and by on- and off-campus field study.

Grade Levels: 9-12

Contact:
Mr. Ron D. Turley
O'Fallon Township High School
600 South Smiley
O'Fallon, IL 62269
(618)632-3507

Hands-On Elementary Science

The Hands-On Elementary Science program teaches problem-solving by developing science process skills. Through this program, the classroom and school grounds become a science laboratory where students undertake hands-on activities blending physical, earth, and life science.

Higher order thinking skills are taught at each grade level through four units of instruction. First graders develop observation skills by studying seeds, patterns, magnets, and liquids. Second graders work on classification skills through the study of insects, water, measurement, and life cycles. In third grade, experimentation skills are emphasized in units of flight, measurement, plants, and structures. Fourth-grade study focuses on analysis with units on bio-communities, electricity, chemistry, and energy transfer. The fifth-grade curriculum emphasizes application with units on earth science, soil analysis, animals, and ecosystems. A unique feature of the program is an optional package of materials students may request to work on over the summer.

In addition to developing student skills, the program fosterspositive teacher attitudes toward science, thereby incerasing the amount of science taught.

Grade Levels: Grades 1-5

Contact:
Ms. Helen Herlocker
Project Director
Hands-On Elementary Science
Dissemination Center
P.O. Box 661
Hampstead, MD 21074

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NATIONAL DIFFUSION NETWORK

Informal Science Study (IfSS)

Informal Science Study (IfSS) is a wholly student-centered approach to the study of physical and biological science. This curriculum appeals to students by offering high-interest mini-units and laboratory exercises, by illustrating scientific principles with concrete examples, and by introducing scientific concepts with non-technical language.

Among IfSS's mini-units is Physics of Fun and Play, which introduces the study of physics through popular amusement park rides. The Informal Science Safari and Toy Workshop unit includes pre-algebra exercises in laboratory activities conducted with such toys as race cars and model rockets. Other modules introduce scientific concepts through analyses of sports and playground activities. The processes of inferring, graphing, predicting, and forming hypotheses are taught through such topics as motion, acceleration, relativity, forces, gravity, time, graphing, and conservation of energy.

Grade Levels: Grades 5-12

Contact:
Dr. Howard Jones
Project Director
500 Coffman, Suite 112
Longmont, CO 80501
(303)651-0833

Investigating and Evaluating Environmental Issues and Actions

Through the Investigating and Evaluating Environmental Issues and Actions program, students develop information processing, problem solving, and decision-making skills while examining environmental problems and issues.

The Issues and Actions program's six modules introduce students to local environmental issues as well as the skills they need investigate, analyze, evaluate, and respond to the issues. Typically completed within one semester, the curriculum can be infused into existing science, social studies, or language arts classes or it can be adapted for interdisciplinary instruction.

In addition to developing critical thinking skills, the program promotes citizenship in students.

Grade Levels: Grades 5-16

Contact:
Ms. Trudi L. Volk
Department of Curriculum and Instruction
Southern Illinois University
Carbondale, IL 62901
(618)536-2441

Jeffco Middle School Life Science Program

The Jeffco Middle School Life Science Program develops critical thinking skills through the study of the human body, basic ecological principles, and environmental problems and issues.

Instruction is delivered in a learning cycle of three phases: exploration, concept formation, and application. In the exploration stage, students conduct an experiment or investigation. During this stage, students are introduced to the phenomena and experiences that lead to concept development. In the final phase, students apply the concept in an application activity or discussion. The development of thinking skills is emphasized throughout the program through cooperative learning, inquiry, and interdiciplinary activities.

The Life Science program is a full year course which can replace existing general science or life science courses or be integrated within a science-health course.

Grade Levels: Grades 7-8

Contact:
Mr. Harold Pratt
Jefferson County Public Schools
1829 Denver West Drive
Building 27
Golden, CO 80401
(303)273-6559

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NATIONAL DIFFUSION NETWORK

Keyboarding, Reading, and Spelling (KRS)

Keyboarding, Reading, and Spelling (KRS) teaches students to use a microcomputer keyboard while learning to type, read, and spell. The program uses a phonetic approach to reading, with the microcomputer serving as an essential component of the instructional process. Following instruction by the teacher, students work independently at the computer as they master skills through reinforced practice.

The KRS program works well in classrooms equipped with one or more computers or in a computer lab

Grade Levels: Grades 1-8

Contact:
Dr. Ethna R. Reid
Reid Foundation
3310 South 2700 East
Salt Lake City, UT 84109
(801)486-5083

Life Lab Science

The Life Lab Science program is an applied science program that transforms elementary school grounds and classrooms into "living laboratories." In this program, students study science, nutrition, and gardening, applying their knowledge to indoor and outdoor gaarden activities.

Students conduct experiments, applying the scientific method as they observe, collect, and analyze data. In addition to maintaining the gardens, students establish worm colonges and raise vegetables, herbs, and flowers.

The Life Lab Science program strives to ensure students' success and future interest in science by increasing their knowledge and skills and by improving their attitudes toward the study of science.

Grade Levels: Grades 2-6

Contact:
Mr. Gary Appel
Life Lab Science Program
1156 High Street
Santa Cruz, CA 95064
(408)459-2001

Mechanical Universe *High School Adaptation*

The Mechanical Universe: *High School Adaptation* program is an innovative approach to motivating students to master a conceptual; understanding of physics.

The program's videotapes can take the student from a view of Newton working at his desk to close-ups of complicated experiments and modern nuclear laboratories, or from animated cartoons of gravitational effects to three-dimensional computer graphics that come alive, clarifying abstract concepts.

Grade Levels: Grades 9-12

Contact:
Dr. Richard P. Olenick
Dept. of Physics
University of Dallas
1845 East Northgate Drive
Irving, TX 75062
(214)721-5072

NATIONAL DIFFUSION NETWORK

Pablo Python Looks at Animals

Pablo Python Looks at Animals presents a basic introduction to life science by combining classroom instruction and the scientific resources of zoos. Stressing the development of observation skills, this multidisciplinary approach incorporates language arts, communication skills, mathematics, reading, and the arts to teach fundamental science skills.

The program consists of a series of six books (and an audiotape of animal sounds), each devoted to a different science topic. Lessons typically begin with a motivational activity such as a song, game, poem, or story. A variety of learning activities involve the students in small group instruction and cooperative learning situations.

Woth its flexible modular format, the program can be used as the entire science curriculum or as a supplement.

Grade Levels: Grades k-3

Contact:
Ms. Annette Berkovits
Director of Education
Bronx Zoo
185th Street and Southern Blvd.
New York, NY 10460
(212)220-5135

Sci-Math

Sci-Math is a modular curriculum that uses the mathematics of rates and ratios to simplify problem solving in science, mathematics, and everyday life. The program is divided into two modules. Module One deals with the arithmetic and logic of proportions. Module Two examines how algebraic equations express proportions and studies the graphical interpretation of proportions.

More than twenty hands-on activities and experiments address situations at home, school and business that are already familiar to students. Through techniques such as coop[erative learning, students are enables to build a tool chest of problem-solving strategies which they can apply beyond their math classes to the sciences and social studies as well as to consumer and business decisions.

Sci-Math can be implemented as a mini-course, a supplement, or a parallel course. Advanced students of algebra, chemistry, or physics can assimilate the core Sci-Math concepts in as little as two weeks; for less advanced or younger students teachers may need three to six weeks depending upon the desired skill level.

Grade Levels: Grades 7-12

Contact:
Mr. James McAuliffe
Sci-Math Director
Education & Technology Foundation
4655 25th Street
San Francisco, CA 94114
(415)824-5911

Successful Inservice Through Turnkey Education (SITE)

Successful Inservice Through Turnkey Education (SITE) is a mathematics inservice designed to develop higher level thinking. Addressing the curriculum and evaluation standards identified by the National Council for Teachers of Mathematics (NCTM), the program provides specific instruction in mathematics and in process skills for teachers in such areas as coóperative learning and questioning strategies.

SITE integrates content and methodology through a variety of hands-on activities involving the use of an assortment of manipulative materials. Designed especially for elementary school instruction, the processes and activities are immediately applicable to the classroom and can be readily integrated into any mathematics curriculum.

Grade Levels: Grades 2-6

Contacts:
Dr. Barbara Berman, Dr. F. J. Friederwitzer, Co-Directors
Project SITE
Educational Support Systems, Inc.
Staten Island, NY 10314
(718)698-3636

NATIONAL DIFFUSION NETWORK

Success Understanding Math (SUM)

Based upon Jean Piaget's research on how children learn mathematics, Success Understanding Math (SUM) provides teaching strategies especially designed to assist elementary school children develop abstract reasoning skills.

Through the SUM approach, teachers guide students as they manipulate concrete objects to solve problems, providing direct instruction to facilitate interactions and an understanding of mathematics concepts.

Originally designed to increase the level of mathematics achievement of children who are functioning below grade level, the materials and teaching techniques of SUM are appropriate for students of all ability levels. The program may also be used in conjunction with any commercial textbook.

Grade Levels: Grades 1-6

Contact:
Ms. Kathleen Bullington
Project Director
Success Understanding Mathematics
Des Moines Public Schools
1800 Grand Avenue, Room 317B
Des Moines, IA 50309
(515)242-7860

Wildlife Inquiry Through Zoo Education (WIZE) Survival Strategies

The Wildlife Inquiry Through Zoo Education (WIZE) program is a non-traditional, multi-disciplinary approach to teaching concepts related to population, ecology, wildlife conservation, and species survival. The program's goal is to encourage young people to approach difficult problems analytically and make decisions informed by a firm understanding of complex scientific concepts.

In Module II, Survival Strategies, students learn that animals are members of populations that interact with one another and that ecological processes affecting animals also affect humans. The program challenges students to address wildlife survival issues of global scale and enables them to provide intelligent answers to its central question: Will wildlife as we know it survive through the 21st century?

The program can serve as an independent curriculum or as a supplement to an existing life science or environmental education program.

Grade Levels: Grades 7-9

Contact:
Ms. Annette Berkovits
Curator of Education
Project Director, Bronx Zoo
185th Street and Southern Blvd.
Bronx, NY 10460
(212)220-5135

Fishbanks, Ltd.

Fishbanks, Ltd., is a microcomputer-based, role playing simulation that teaches the principales of sustainable resource management. Its purpose is to promote an understanding of the complex, dynamic systems governing productivity in the natural environment, thereby, enabling students to formulate economically and politically feasible policies that will sustain the productivity of natural resources.

The program teaches students facts about the finishing industry and prepares them to act as informed, effective problem solvers. Students then debate policies related to environmental resources, applying analytic reasoning, negotiation, and collective decision-making skills.

The two-hour simulation is based on a multidisciplinary model linking environmental science and biology to economics, social studies and mathematics while enhancing general reasoning and communication skills.

Grade Levels: 7-12

Contact:
Ms. Barbara van der Waals
Laboratory for Interactive Learning
Institute for Policy and Social Research
Hood House
University of New Hampshire
Durham, NH 03824
(603) 862-2186

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